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9-15 August 1984

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Vol 3 No 32

Oric runs into trouble

ORIC Products International — manufacturers of the Atmos computer — has run into cash-flow problems.

The company has cancelled all its advertising in the UK for the Autumn and has been threatened with legal action by Pan book publishers over outstanding debts.

"Oric has switched its advertising to France, Germany and Italy for the Christmas run-up," commented an Oric spokesman. "The UK market has been quieter than ever this year, and we will be concentrating on the European market."

This move has caused concern over Oric's position, not least at Prism, which distributes the Oric Atmos machine. "We are currently in negotiations with Oric about the decision," said Prism's Terry Cartwright. "It is slightly worrying, as when we took on the Oric contract, we understood that

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Thames goes soft

THAMES Television is negotiating with DK'tronics to develop computer games based on its successful TV programmes like *Minder* and *The Sweeney*.

"No details have yet been finalised, but we are experimenting with various characters on screen, to ensure that they will be satisfactorily represented in the finished game," said Nick Jones, Thames publishing manager.

"While we are dealing with DK'tronics at the moment, it is too early to say yet whether it will be an exclusive deal to produce games for any particular shows.

"While programmes like *Minder*, *The Sweeney* and so on seem obvious candidates for a computer game, we have not settled exactly which will be used.

"We will probably be using more than one machine — launching the games on one and then converting. The Spectrum, Commodore and BBC are all 'DK'tronics territory', so we wouldn't be too restricted."

Thames are also planning to merchandise TV shows to be used for educational computer material. Programmes such as *Rainbow* are under consideration. "We are interested in anything that proves a worthwhile extension of our material," Nick continued. He hopes that the first Thames computer titles will be available in time

George Cole and Dennis Waterman in a scene from *Minder*

for Christmas. "Because of the Christmas peak, we are aware that there is some urgency to finalise the deal."

This will not be the first such deal in which Thames has been involved. Thorn-EMI has already acquired a licence to develop the character of Dangermouse for the micro, and a *Dangermouse* game should be available this Autumn. "The deal with Dangermouse is slightly different in that it is a cartoon character, and is much more straightforward to convert to the computer," said Nick. "With mainstream entertainment programmes using real people we need to be more careful with characterisation."

However, the idea of using ITV programmes as a basis for computer games has already been taken up by Central TV,

continued on page 5 ▶

Sierra's UK debut

SOFTWARE Projects, of *Manic Miner* and *Jet Set Willy* fame, is the latest company to bring American games over to the UK.

It has concluded a licensing agreement with Sierra — publishers of the successful US adventure *Kings Quest* — to convert its Apple, Atari and

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Giant strides in programming and home computer graphics have meant that software authors are now attempting effects that only a few years ago would have been unthinkable.

The primitive graphics of micros like the ZX81 originally proved limiting and most software houses began by writing copies of existing, successful arcade games — *Defender*, *Scramble* and many others.

More recently it has become fashionable to base games on an established character. Think of almost any cartoon figure and it will now be licensed to a particular software house. Sierra has the Disney characters. Adventure International has the Marvel comic heroes. Even Snoopy has succumbed.

Just a few years ago there wouldn't have been any point in licensing Goofy. It's a bit tricky to produce something that is recognisable as Disney's number one dog within an eight by eight pixel square.

Home micro software has come on far enough that such things are now possible — really big chunky sprites and striking graphics — and cartoon characters were the first to be picked up because they lent themselves to a computer graphics adaptation.

Now software houses are beginning to go a stage further by licensing non-cartoon characters. These present entirely different types of conversion problems. First attempts — with *ET*, *007* and even *Dr Who* — have not been promising. Now Thames is looking at video games based on series like *Minder*.

The gulf between people's perception of characters like *Minder*'s Arthur Daly and the kind of effects possible with computer graphics must present a great new challenge for the software author.

>Presents...

News > Oric runs into trouble > Software Projects to market US games

Star game > Go to the dogs in *The Stow* — a greyhound racing game

Street Life > Journalist Robin Bradbeer finds himself at the other end of the interview table as he talks about his new company's robot

Software reviews > *Autocalc 64*, a handy spreadsheet from Richard Shepherd > and a sprite designer *Simonsoft Sprites*, for the BBCB

Hardware review > Acorn's Prestel Adaptor comes under close scrutiny from Barbara Conway

The QL Page > How do the different variants of QL SuperBasic compare?

Commodore 64 > A two-part article explains how to give the Commodore windows

Dragon > Useful machine-code routines in this week's article in the Assembly language series

Spectrum > Alan McDonald completes his five-part machine-code adventure writing series

BBC & Electron > Concluding Christopher Bowerman's *Paintbox* program for the BBCB

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> Futures...

Enveloping on the BBC... Build your own RS232 interface for the Spectrum... QL microdrive utility... and Star Game is *Alien Raid* — with streamers, swarms and mutants — for the 48K Spectrum.



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Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2R 3LD. Tel 01-437 4343 Telex 296275 Typeset by The Artwork Group, 55-63 Goswell Road, London EC1, in association with Ink on Paper Ltd Printed by East Midland Litho Printers Ltd, Oundle Road, Woodston, Peterborough PE2 9QR Distributed by SM Distribution, London SW9, tel 01-274 8611, telex 261643. © Sunshine Publications Ltd 1984.

ABC

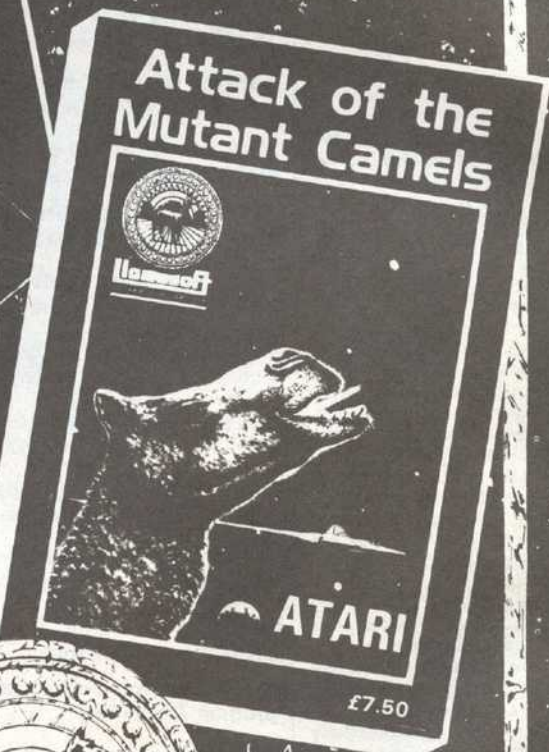
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Sierra's UK debut

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IBM games for popular British micros.

"The negotiations were to convert for the Spectrum," said Colin Stokes of Software Projects. "However, the first release will be *B C Quest for Tires*, which is already available for the Commodore 64, so we hope to have that ready soon on both cassette and disc."

B C Quest for Tires concerns a caveman's journey through the Stone Age on the wheel he has just invented and will cost £9.95 on cassette and £11.95 on disc.



Software Projects is also involved in similar negotiations with other top US software houses, although no details are yet available.

The company has also gained a licence to produce a home micro version of the CVS arcade game *Hunchback at the*

Oric

◀ continued from page 1

they would keep up their promotion levels, and we are now looking very closely at our sales forecast for the Oric."

The outstanding debt to Pan is for the publishing of the Oric Atmos manual. Last week Pan were said to be on the verge of serving a writ against Oric for non-payment. "The dispute with Pan books is being settled amicably," continued the Oric spokesman. "There is no suggestion of any court action."

A spokesman for Pan declined to comment on the situation, other than to deny that the dispute had been settled, and to state that previously published figures for the debt of

Olympics. The game was originated by the now-defunct Century Electronics and CVS — being founded by ex-Century boss David Jones — took it over.

Sierra is currently working on a strategy game based on the TV series *The Prisoner*. In the game the player will assume the role of Number 6, the central character, and must find the way to leave the island where the prisoner is being held. *The Prisoner* should be released in the US early next year, and according to Sierra's vice president Bob Schneider, once it has been established in the States, it will be made available in Britain.

New MD at Atari

ATARI's new UK managing director will be David Harris, former Commodore International sales and marketing director.

Harris is still in the US and the exact date of his arrival in Britain to take up the appointment has not yet been decided.

Under new management from former Commodore chief Jack Tramiel, the UK branch of Atari has been renamed Atari Corporation UK.

Imagine debts top £1m

DEBTS at the failed Liverpool software house Imagine amount to more than £1m, a meeting of creditors has been told.

Liverpool chartered accountant Arthur Young, McClelland, Moores and Co. were appointed liquidators at the meeting, held on August 2.

In addition to the £650,000 owed to trade creditors — including £250,000 to Marshall Cavendish — Imagine owes £100,000 to its bank, Lloyds of Water Street, and about £250,000 in wages, holiday pay, National Insurance and VAT.

It transpired from the mee-

between £100,000 and £120,000 were overestimated.

Oric has also been in talks with the printers, Leagrave Press in Luton over debts outstanding since March.

Top games for MSX

THORN-EMI will be setting up distribution for the forthcoming MSX machines on a grand scale.

Forty-five top-selling titles from the UK's major software companies will be available from Thorn-EMI in 'starter packs' with twenty different games in each.

Henry Kitchen, Thorn's marketing accounting manager, explained, "We have firm agreements to distribute many of the top selling games — *Atic Atac* and *Sabre Wulf* from Ultimate, *Snooker* from Visions, *A & F's Chuckie Egg*, *Cavelon* and *Hunchback* from Ocean, *Fred* and *Boogaboo*

from Quicksilver are all included.

"We intended to have three different packs to send retailers, so obviously some games will find themselves in more than one."

"Once companies realised Thorn-EMI were making a firm commitment with MSX, they were only too happy to come to an agreement."

MSX games is distributed by Thorn-EMI should be available in mid-September — at the same time as the launch of the first MSX machine from Toshiba.

Individual software titles will be priced between £7 and £8.

Return to sender

THE first Sinclair QL customers are now being invited to send their machines back to Sinclair for a 'Rom refit'.

The first QLs were sent out with 'dongle' Eproms plugged into the Rom socket. Sinclair has undertaken to refit these machines free of charge, and return the QLs within 10 days.

"We are staggering the return of the QLs so that those who received them first will get them refitted first," said a Sinclair spokesman, "If all goes smoothly, we hope to have all the refits completed by the end of August."

Those customers with the FB or PM SuperBasic variants are also being asked to return their four software application packages. Sinclair will send back compatible replace-

menting that the value of Imagine's assets is not yet known. It is also unclear whether the company's Megagames are included in its assets, after Imagine directors Mark Butler, Dave Lawson and Ian Hetherington formed a separate company called Finchspeer, and a contract was agreed handing over the Megagames contract to Finchspeer.

Judith Austin, of the Official Receiver's Office in Liverpool, said, "The Megagames are included in Imagine's assets, subject to an agreement still to be sorted out."

ments for the upgraded machine.

Sinclair is still making improvements to SuperBasic — JM being the latest version. Machines delivered in the last week contain this new variant. "JM is largely the same as AH but with some small improvements," the spokesman continued.

Languages currently under development for the QL in-



clude Pascal, C, 68000 Assembler, Micro APL and BCPL.

● Sinclair may have to delay its promised 1985 share flotation because estimated profits of £25m for the year now ended are now not expected to be achieved.

Thames

◀ continued from page 1

who commissioned Tynesoft Computer Software to produce *Auf Wiedersehen Pet*, a strategy game for Spectrum, Commodore 64 and BBC, which involves building a brick wall, and getting safely home from the Bierkeller. Other Central programmes are also due to appear as computer games before Christmas.

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Once upon a time...

I notice in your *Book Ends* section in the July 26 issue that you refer to the Babani books, which have been well known to radio amateurs and the like for almost half a century.

You may be interested to learn that book No 161 — which cost me 3/6 (old money) about twenty-five years ago and deals with radio and electronics data — shows the general series editor to be none other than... guess who? Clive Sinclair.

R A Davis
39 Boxley Drive
West Bridgford
Notts NG2 7GQ

Subjective reviewing

Simon Mills, judging by his letter to *PCW* (July, 26), is labouring under a misapprehension regarding a reviewer's duties.

Reviewing is, necessarily, a subjective art, and the resulting reviews have to be approached as such by the reader, who should always add a mental "In my opinion" at the start of each review. To paraphrase Owen: "all a reviewer can do today is warn".

As the originator of the *Hobbit* review quoted by Simon I am very aware that phrases such as the one he holds up for examination are the rocks upon which the reviewer's craft can easily founder — how many times have you read those immortal words: "The ultimate in Spectrum/CBM etc graphics"? But words like these are not meant for disinterment — the next week will surely bring some even better example of Spectrum/CBM, or whatever, graphics.

However, I stand by the *Hobbit* quote. It was at the time the adventure to judge others by. It was also the adventure that brought that type of game to a much wider audience. Nowhere in the original review did I say that all ensuing programs would have to include graphics (and I have many times indicated a personal preference for the old 'boring'

text-only kind of adventure) — only that adventure writers could see what was possible and use *The Hobbit* as their yardstick.

Tony Bridge

Marketing puzzle

First, my congratulations on keeping ahead of the field in-so-far as the QL is concerned. Your program listings, I have found invaluable. Despite the claims of one computer monthly magazine you are at least a lap ahead.

I have had my QL for a month now. It is one of, I imagine, the last sent out with the Dangle attachment. I wait for a call to return it for fitment of internal Rom. Of the machine itself I have nothing but praise, I had previously owned ZX81 and Spectrum with microdrive, and ordered before application forms were available.

The appalling QL manual has cost me many wasted hours. Its conception is excellent, but the multitude of mistakes which should have been found by any proof-reader with a knowledge of Basic, ruined it completely. Errors ranged from the use of lower-case key-words as variables (that did take a little figuring out initially, particularly as the idea of DAYS as a Key-word had never entered my head) to lines listed in the wrong order, lines missed, and even consecutive lines with the same line number. I understand that a re-write has been done. I cannot receive it too soon.

Attempts to get some sense from chaos by writing to Sin-

clair have met with a standardised letter telling me to join QLUB. Naturally, I had not become a member as ordering pre order form I didn't know of its existence. But finding myself with a second QL on order when I filled in an order form and sent it off with a careful note not to duplicate the previous order and having put down QLUB on that order form, I'm scared of confusing the issue even more.

I have spent most of my working life in marketing, not business machinery or home-appliances mind you, and find the Sinclair marketing strategy very puzzling. It says very little for MENSA.

Wil Jackson
131 Denton
Malden Crescent
London NW1

Getting away with murder

When I bought my home computer, eighteen months ago I knew absolutely nothing about computers. As such I was at the mercy of the person selling me the machine.

Fortunately, I ended up with a Sinclair Spectrum which has served me well ever since. However, now I know a good deal more about computers I realise that much of the advertising of home computers is, to say the least, misleading. Indeed, computer manufacturers seem to get away with murder.

How a complete novice manages to select the correct machine for his/her needs baffles me. Take for example the memory size of computers. My Spectrum 48K has about 43K available Ram for programming. The Commodore 64 has 39K available. Of course, the Commodore has superior graphics and sound but where in the advertising is the actual available memory mentioned? Instead we are just told it has a 'massive memory'. To a first time buyer it seems logical to assume that you can do more programming on a 64K computer than on one that has a mere 48K. In this case, not so.

Recent events with the QL have caused me to wonder if

any other industry could get away with it!

A recent consumer report came to the conclusion that the home computer industry had a long way to go in improving its standards in advertising and customer service. Buying a computer is a mine-field for first time buyers. And jargon, clever but misleading advertising and often inexperienced shop staff make this task even more difficult.

Neil Bathurst,
21 Cowleymoor Road,
Tiverton,
Devon

House of cards

Since imitation is the sincerest form of flattery — and many of us brought a computer to learn — why don't more software authors spend less time concealing their programs from copying and alteration and more time making their techniques available to the rest of us so the quality of programs written by the hobbyist can rise.

After all, there are laws to penalise people profiting from copying software and they are enforced.

These software houses! Many of them are turning out to be 'house of cards'. Impressive cars, salaries and adverts, but of little substance.

Chris Sawford
145 Bryncyn
Pentwyn
Cardiff

Support the Electron

After owning an Acorn Electron for almost a year, I am somewhat distressed at the lack of support magazines and software houses are giving it.

It beats the Commodore 64 on language and graphics and I believe it is currently the third best seller.

Yet people don't seem to be taking advantage of the enormous potential offered by Acorn's winner.

Nicholas Haighey
(a lonely Electron owner)
80 Parkdale Road
Sheldon
Birmingham

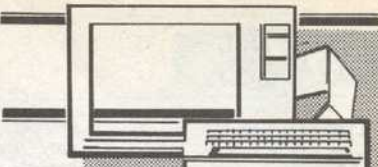


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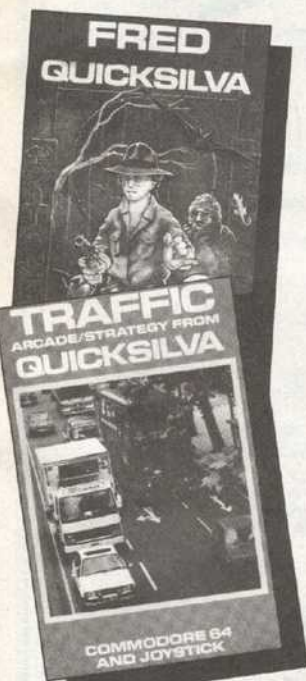
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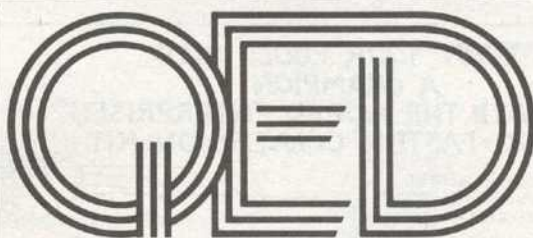
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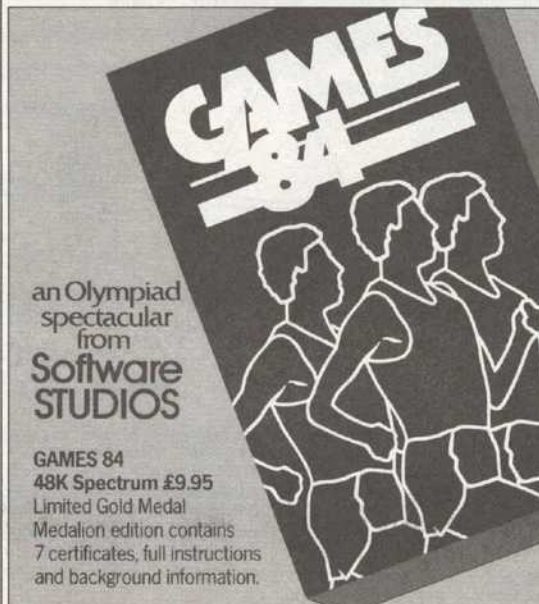
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The Stow

It's a dog's life. Greyhound racing at *The Stow* by Dave Taylor-Wadsworth

The Stow — slang for Walthamstow Dog Stadium in North-East London — is the setting for this week's game.

The program uses the Sprite facility of the Commodore 64 to present the greyhounds. There are six dogs and up to four players are asked to bet on them from a £100 float they each have to start. The minimum stake is £10 and if your funds drop below £10 you

are out of the game. During the play there is an on-screen reminder of which dog you have selected.

Program notes

0-8	Sets up sprites
10-38	Preparation routines for the game: bets, dogs etc
80-92	The on-screen graphics routine
100-140	The main game loop

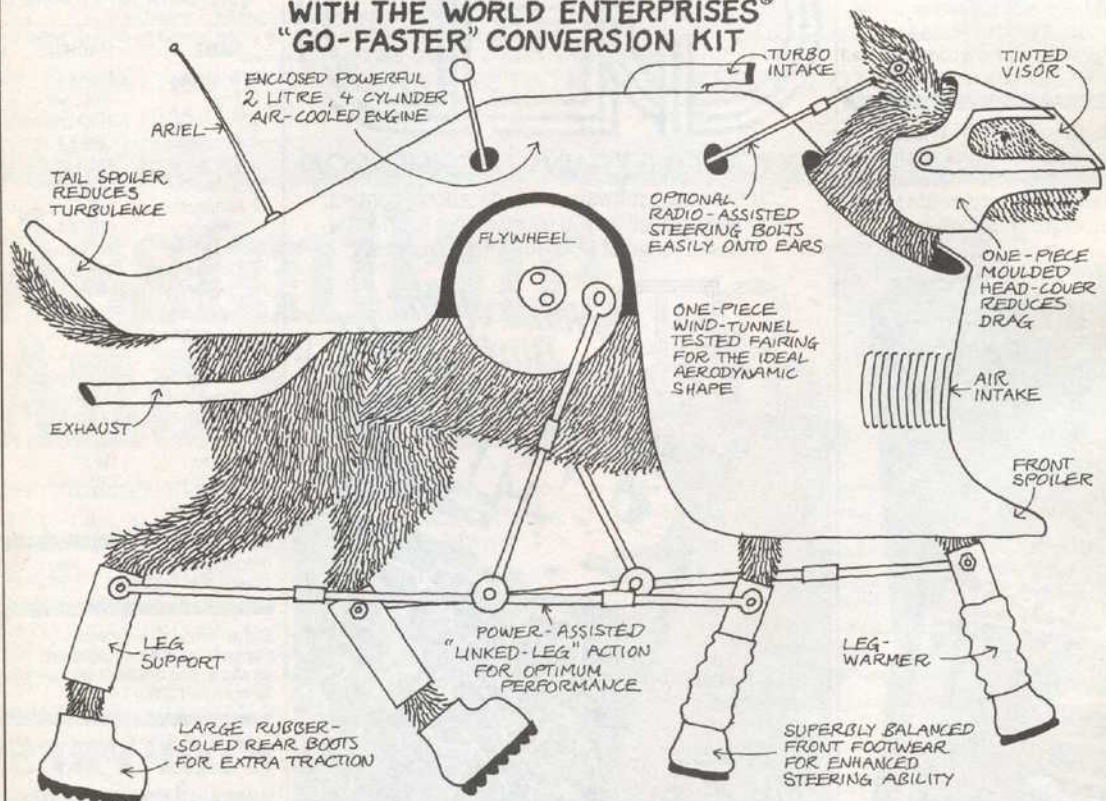
230-238
300-312
1000-1003

End of game options
Instructions
Data for sprites

Variables used

PL	— Number of players
D	— The dog currently being bet on
B	— The bet
M	— The money remaining
NS	— Player name

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Down to zero

Christina Erskine talks to Robin Bradbeer about Intergalactic Robots and other such things



To those of us brought up on CP30, R2-D2, and K9 today's robots may seem more than a little disappointing.

Robin Bradbeer — who has been in the industry longer than most (he edited the Spectrum manual among other things) thinks the first product from his new robotics company Zero could change all that.

"It is extremely easy to build robot arms and turtles" he points out, "but making robots which actually do something is another matter altogether."

Robin first became interested in robotics some three years ago while running a computer club at North London Polytechnic. One member, Dave Buckley, now a co-director of the new company — IGR — had studied the subject, and his enthusiasm was infectious.

"Around Christmas 1982, Dave began work on designing and manufacturing his own robot rather than just playing with them," said Robin. "A month later, I was over at CES in Las Vegas where Androbot's two robots *Bob* and *Topo* were launched. It struck me that robots could be more than just a hobby — they could be big business — and it seemed that many people were largely in the dark on the subject."

The pair decided to jump in with both feet, and left their jobs at North London Poly to go full-time into robot manufacture. The first robot, *Zeaker*, was praised in a review in *Practical Electronics*, and Colne Robotics subsequently agreed to manufacture *Zeaker* under licence. "Our company, Intergalactic Robots, was formed a year ago, and shortened to IGR almost immediately," Robin continued.

"A number of projects suggested themselves to us straightaway, but at the moment we are only going ahead with a couple. We have bought back the rights to *Zeaker* from

Colne, and have redesigned it. It's now called *Zeaker 1*, and will be relaunched in kit form — sometime in the New Year.

"Then we have our new product coming out in October — *Zero 2*, which will be available in both kit and ready-built form."

"*Zero* stands for *Zeaker Educational Robot*, but it's a quite different type of robot, from the *Zeaker*."

"*Zero 2* is aimed at home rather than school use, and while it is basically a box that moves around and bumps into things, it has huge possibilities for expansion and development."

"It is designed to interface with the Spectrum, Commodore and BBC B computers, using an RS232 port and has been particularly designed to interface directly to the language Logo. It is just possible that it may be sold in a package with Sinclair Logo, although that plan is still in the pipeline."

"However it will also operate with Sinclair

and BBC Microprolog, Comal for the Commodore, and QDOS — plugging straight into the back of the QL."

The robot's own assembly language, Zero Control Language (ZCL) will give it a basic understanding of simple commands, and will look the same on any micro. One ZCL tape will be supplied with each machine bought. *Zero 2* also has turtle capabilities with a motor-driven pen clipping to the exterior.

"The pen has two distinct advantages over other turtle-type robots," Robin explained. "Firstly, we did a lot of market research in schools to find out what people would want from a robot. While the ability to use turtle graphics was popular, the usual difficulty with changing pens was definitely unpopular. With *Zero 2*, the pen needs only to be unclipped, and a new one clipped on. Having it driven by motor rather than solenoid, also means that something other than a pen could be clipped in, and driven by the robot, for instance, a 'grabber' or 'fork-lift truck' type mechanism."

"On the expansion side, our immediate plans are for a speech synthesiser, and a short-range infra-red sensor, so that you can do away with the cord between the robot and the micro. We're hoping that other companies will take on the job of manufacturing other add-ons. If they don't, I suppose we'll have to resort to publishing ideas in magazines."

The magazines may well turn out to be Robin's own — another project for the New Year is to establish a robotics magazine, probably to be called *Droidsmitth*. As a one-time editor of *Educational Computing*, and involved in the launch of *Computer and Video Games* and *Sinclair Projects*, this is hardly a new departure for him.

"People shouldn't be frightened off by the idea of owning a robot. Our basic philosophy is to assure people that they are in control, and to encourage the idea that robots can first be used as toys."

"For instance there are ways to extend conventional-style computer games to use *Zero 2*. You could, say, build a maze from bricks and guide the robot through it via the keyboard, then program it to go through itself, and feed the information back to the screen."

"Eventually, you could have two robots playing *Pacman*, or jousting with each other in the maze."

"I expect that about 80 per cent of people who buy *Zero 2* will simply use it for fun, another 15 per cent may tinker with the software while the remainder will get out the soldering iron and re-build it."

For the last categories, Robin has a *Zero 3* in mind. "It will be a buggy-type robot, aimed at the serious user, which we intend to be especially useful for research and development purposes."

Zero 2 will be available in October this year. Ready-built versions, have a target price of around £100 while the kits will cost between £70 and £80.

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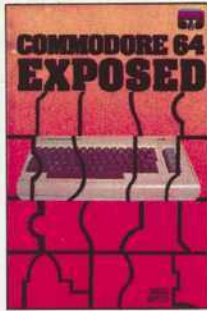
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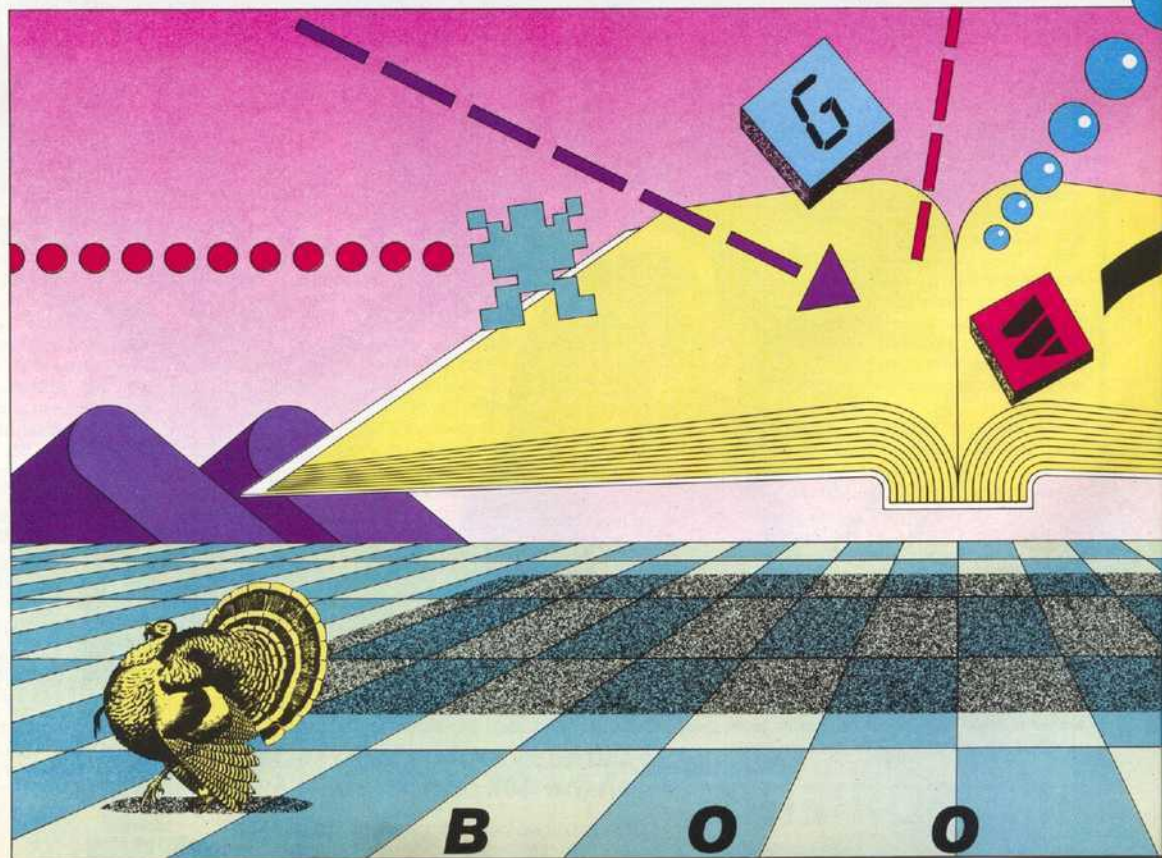
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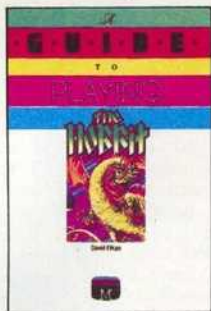
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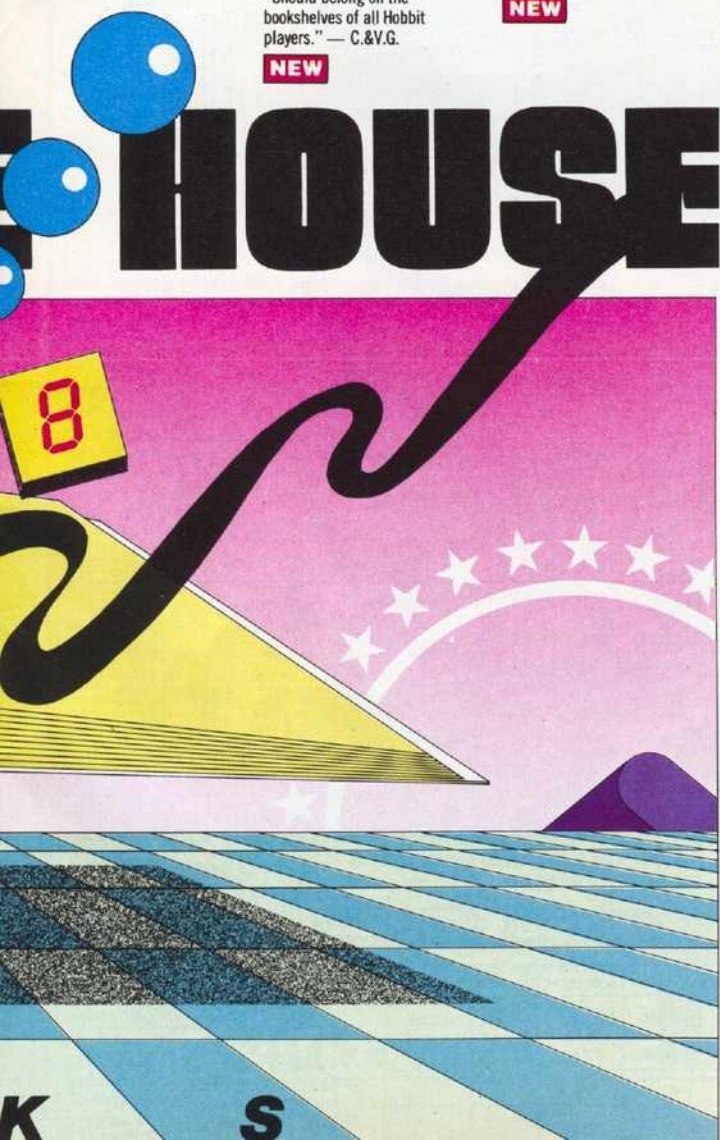
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Financial

Program Autocalc 64 Price £14.95 **Micro** Commodore 64 **Supplier** Richard Shepherd Software, Elm House, 23-25 Elmsholt Lane, Slough

Spreadsheet programs tend to be one of the most expensive items of software that most micro owners are likely to buy. So *Autocalc 64* from Richard Shepherd Software is an interesting new release, since it costs only

on the spreadsheet are invoked by pressing the *F1* key, which puts you in command mode. You can then enter a one-letter command, followed by further information if prompted. This procedure must be followed, for example, to enter data, text or a formula into a cell, to recalculate the spreadsheet, to control its format, to replicate cells, etc. This process is a bit tedious for data entry, but works OK for the other functions.

At the price, this program offers very good value. The

re-calc off		pc
cell: a1 re-calc off pc		
text: a1 Company Ltd		
a		b
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£14.95 on tape or £19.95 on disc, far less than virtually any of its competitors.

The facilities provided are indeed as one would expect, with up to 2000 cells of data in two dimensions (maximum 255 in any direction). All functions

only major omissions, compared to more expensive software, are graphics (none) and flexible print formatting.

Richard Corfield



Rubies

Program Sultans Maze Micro Amstrad CPC464 **Price** £7.95 **Supplier** Amsoft, Brentwood House, 169 Kings Road, Essex.

Sultan's Maze is a *Hunt the Wumpus* style maze game for the new Amstrad machine.

All you need to know about the plot is that the Sultan's six rubies are now scattered about Hampton Court, guarded by the ghost of the Sultan's companion now known as the Guardian. Like the mercenary idiot you are you have decided enter the maze and try to remove the rubies.

Sultans Maze is a good 3D maze game which is very simple to play and requires thought, rather than fast reflexes, though it is difficult to win on the highest of the nine

levels.

The numeric keypad is used for control of your position, rotate, move forward, etc as well as keys to view the map, pick-up and drop rubies and so on. As you move around you get tired, but, by returning to the palace you can be refreshed.

The program is written in Basic which results in the drawing of the clear 3D views not being instantaneous but this doesn't detract from the game. Comprehensive, though slightly long-winded instructions are available on loading.

The game has some very nice touches, for example, the ability to jump through the hedges on the lower levels, and the way in which you can orientate yourself by looking at the sky.

Greg Pearson



Wham Bam

Program Star Striker Micro BBC B **Price** £7.95 **Supplier** Superior Software, Regent Street, Skinner Lane, Leeds LS7 1AX.

Wham bam action again from Superior — and great fun too.

You control a three-stage rocket and each section has to fight its own series of battles before joining to the others. You get something of the shooting action of *Galaxian*-type games and the delicate control of a lunar-lander as you coax the separate stages together.

The nose-cone fires single bullets against swarms of pretty butterfly aliens. After a shot or two these turn into ravaging beasts that are much harder to hit. Various coloured meemies are zonked... then come such extra terrors as hurtling



asteroids which zoom at you extremely fast and some peculiarly nasty fireballs that drip venom viciously and suddenly.

What addicted me to this game was the second stage rocket which fires two bullets at once. That doesn't sound very special but it's the touch of genius that hooks you. It is very satisfying to blast pairs of aliens at once rather than relying on lonely single shots.

Dave Watterson



Self-satisfied

Program Hi Bouncer Micro BBC B **Price** £6.95 **Supplier** Mirrorsoft, Holborn Circus, London EC1

The Mr Men bounce into colourful arcade action in this bright and breezy Mirrorsoft offering.

Roger Hargreaves's cheerful characters give their special appeal to a game that is tricky enough to satisfy everyone but not too hard to frustrate fairly young children.

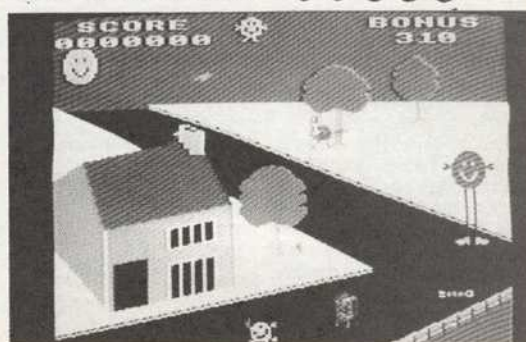
There are in fact two games — the main one and a practice session which is slower but not much easier. The screens are

colourful, the music very good and the action outstanding. Mr Bouncy is your man and he has to adopt different tactics on each of four main games.

The printed instructions are slightly misleading on the first round — unusual for this range — but you'll soon get the hang of it. Youngsters will certainly love it but this isn't a tiny tots program — adults beware, it's harder than it looks.

The real test is to see if it can capture the lovable nature of the Mr Men. It does that with excellent animation and a series of little touches like the self-satisfied smile of Mr Bouncy each time he succeeds.

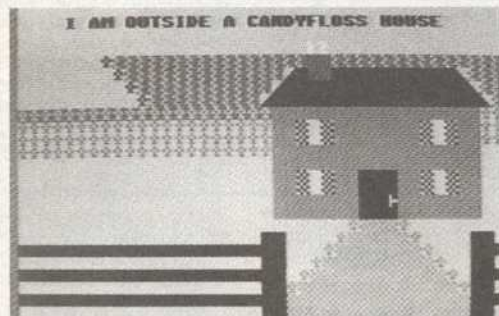
Dave Watterson



Bo Peep

Price £5.95 **Micro** Commodore 64 **Supplier** Jolly Rogers Software, 19 Castleron Avenue, Barnhurst, Bexleyheath, Kent.

My First Adventure from Jolly Rogers Software is, as the name implies, an introduction to adventure games for children. As such it has a simple structure in which you can make your way round the countryside, via woods, streams, cottages and fields. On the way you meet various nursery rhyme characters, like Little Bo Peep, Old Mother Hubbard, etc.



The game is primarily text based, and the commands follow the usual pattern, eg, *Look East* or *Get Shoe*. However, one major omission is a glossary function to find out what words

the program will understand. This leads to a certain amount of guesswork when typing in the commands. Fortunately, if an invalid response is given, the program replies with a suitable message and lets you try again. As well as the text, there are some simple block graphics pictures to illustrate a few of the locations. These are quite nicely done, and certainly add to the visual interest.

This is a very simple adventure, with quite a small number of locations and not many objects and other characters to worry about. These factors, plus the nursery rhyme theme, make it suitable for very young children. However, older children will quickly complete the

game, and, having completed it, there is not much point in having another go.

Richard Corfield



Day After

Program *Ground Zero* **Micro** Spectrum 48K **Price** £6.95 **Supplier** Artic, Main Street, Brandesburton, Driffield, North Humberside.

The title of this game seemed to imply that it was a new version of *Missile Command*, but I knew this could not be. Artic already sells one reasonable version of the game. I was mystified.

Ground Zero in fact turns out to be a text adventure written with the *Quill*. Set just before a nuclear attack (the day before *The Day After*, perhaps?) you start off all alone in a house in a cul-de-sac. At least the computer keeps telling you how quiet it is, and I have yet to find any other people.

So there is nothing else for it but to explore. This all works very well, as anyone familiar with the *Quill* will know — you use verb-noun commands to find your way around. There do not seem, at least so far, to be many difficult puzzles to solve — everything is fairly logical and easy. This might make it suitable for newcomers to the world of adventures, even if the theme is slightly morbid.

I am surprised though that Artic have published this — it seems somewhat below the standard of their now ancient adventure series.

It is possible to produce better programs with the highly successful *Quill* adventure-building utility than this.

David Lester



The Hook

Program *Space Commando* **Micro** Amstrad CPC464 **Price** £8.95 **Supplier** Terminal Software, Derby House, Derby Street, Bury.

Space Commando is claimed to be, and is, a "fast-action arcade style game in fantastic 3D perspective".

The object of the game is to rid the galaxy of hostile aliens. A fairly standard plot, which is improved by the ability to select which of the many aliens to attack next.

When you arrive in the selected sector of the galaxy, you can see a from-the-cockpit view of the surrounding space and a background of moving stars. In the centre of the screen are your gunshots into which you must manoeuvre the

aliens, using a joystick (not keyboard), which start as a dot and gradually get bigger and very detailed.

The battle isn't all one-sided, since when the aliens get close enough to you they will open fire, and any hits will decrease your limited energy resources even faster.

When you have destroyed sufficient aliens you will be able to choose another type. If you are low on energy it is possible to move to a sector which contains your mother-ship and refuel from it.

The fast action, excellent graphics and good sound, as well as the incentive of working up through the ranks of space pilot until you become a space commando make this a very good game.

Greg Pearson

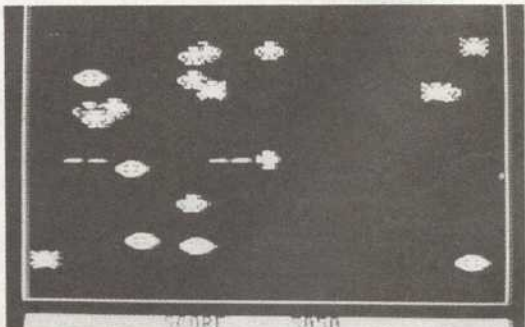


Routine

Program *Arena 3000* **Price** £9.95 (disc) **Micro** Commodore 64 **Supplier** Microdeal 14, Truro Rd, St Austell, Cornwall

One unusual feature distinguishes *Arena 3000* from most arcade shoot-outs. The game consists of a series of screens containing different patterns of aliens. You control a man who can move

you always fire in the direction you are facing. However, if two are used, one stick controls movement in the usual way, while the other is for firing. You fire in the direction this second stick is pointing and no button pressing is required, ie, you can move in one direction and fire in another. Although it takes a bit of getting used to, this is a very effective means of control, and it certainly makes the game faster and easier to play. Apart from this, the game is pretty routine. The graphics



around the arena shooting the aliens. He must kill all of them before they converge on him, and thus destroy him. So far nothing new.

The unusual feature is the method of controlling the movement and firing. The game can be played with either one or two joysticks. If one is used,

the controls are standard, and and sound are unexceptional. Also the patterns of play are rather repetitive, although quick reactions are needed once you get on to the more difficult screens.

Richard Corfield



Arch enemy

Program Laser Reflex Micro BBC B Price £7.95 Supplier Talent Computer Systems, Curran Buildings, 101 St James Rd, Glasgow.

That old arch-enemy in the computer game, the 'alien invader' is back, this time trying to plunder the fuel supplies stored in silos beneath the surface of a remote asteroid refuelling base.

With a rallying cry of 'No free gas for Ganymede', which must surely rate amongst the classic

at which the laser strikes the mirror and hence the direction of the beam — a new type of 'deflection-shooting' for trigger happy alien zappers to master.

In addition, the laser cannon must be moved at intervals during the game to an energy bank there to be re-charged with its laser energy — without which the beam becomes both slower and shorter.

Scoring, as ever, depends on the number of waves of alien drones successfully repelled in a game consisting of three lives; each life is lost when the aliens establish their greedy siphons on all of the four sub-

Simonsoft's program allows up to 48 sprites — 12 different ones with up to 3 copies of each. Supersprites take up the places allotted to more than one basic sprite. The routines to drive them come in a set of twenty machine-code programs and you use only the one which has the facilities you need for your purpose — thus saving memory in your program. Also included is a library of useful sprite designs and two simple, sample games to show off how to use the sprites.

My only quibble is that the

sixteen-page booklet which accompanies the package spends so much time raving about the super powers of the program it does not fully explain how to use it.

Nonetheless finding out is fascinating and totally absorbing. Use it for designing your own games, an animated title page or a display. You'll have to be dragged away from the machine...

Dave Watterson



Surrealist

Program Panorama (H) Price £17.95 **Micro Commodore 64 Supplier** Talent Computer Systems, Freeport, Glasgow.

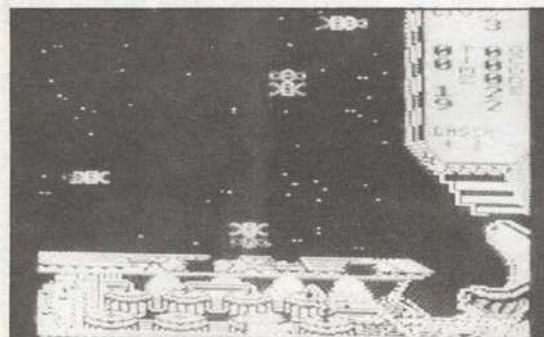
Although the Commodore 64 is capable of high resolution graphics, it is difficult and tedious to build up detailed pictures in hi-res mode, even if you have one of the many Basic extenders which provide graphics commands. *Panorama (H)* is a utility from Talent Computer Systems which overcomes this limitation. It provides a straightforward means of producing coloured sketches in standard hi-res mode, ie, 320 x 200 pixels with two colours per 8 x 8 cell.

The system has two main screens — the drawing screen and the menu. The menu lists all the available commands. These are codes of one or two characters, and they enable you to perform the functions required for drawing and colouring your picture.

Commands include those for plotting points, drawing lines, circles and ellipses, setting the colours, defining blocks of texture, filling areas with colour, moving or inverting areas, saving and restoring your picture, and many others. On the drawing screen, you can control the cursor by joystick or keyboard, and all the commands work here as well as via the menu.

Many nice features are included in this package, such as defining up to four colour schemes for each picture, and enlarging a portion of your sketch — very useful for detailed work. Altogether, this is a professionally presented utility, simple and quick to use, which provides virtually all the facilities required for the creation and storage of hi-res pictures. The striking and surrealised demo picture, which comes on the same tape, shows what impressive results can be achieved.

Richard Corfield



war cries of modern times ('over the top', 'Banzai!' etc included), the defence of the asteroid begins.

Unlike most other common or garden invader defences, the laser does not fire vertically, but from beneath the roof of the refuelling base, the laser being deflected off a parabolic mirror to the right of the screen.

Moving the laser cannon to the left or right alters the angle

surface fuel silos. Bonus points are awarded for destroying the drones near the top of the screen.

The game can be played using either joysticks or the keyboard, with the useful option of selecting which keys control the movement of the laser cannon in the case of the latter.

Simon Wilson



Carried away

Program Simonsoft Sprites Version Two Micro BBCB Price £12.95 (&cassette) £15.95 (disc) **Supplier** Simonsoft, 25 Tatham Road, Abingdon, Oxon OX14 1QB.

More fun than *Invaders*, more compulsive than adventuring, faster than a speeding zargon, able to leap tall buildings at a bound... I'm totally carried away by Simon Rey-

nolds's *Sprites Version Two* package.

Sprites are graphics figures or shapes which are defined once then can be flown all over the screen at great speed. With this package they may either follow pre-set paths or be under control led from a Basic program. You can make a Supersprite which is up to 24 x 24 pixels compared with the usual 7 x 8 pixels. You can also enlarge both ordinary and Supersprites up to 5 times! Add in a collision detection system and you have the basis of umpteen arcade games.

BLOCKS	FILL	LINES
BE: Erase	FA: Find area	L: Line
BD: Drag	FT: Fill texture	R: R-band
BC: Copy	FC: Fill colour	C: Circle
BM: Mark	FI: Fill inverse texture	EL: Ellipse
MI: Mirror (H)		Z: Erase
MO: Mirror (V)		
SELECT	DEFINE	POINTS
B: Background	DT: Texture	(etc)
I: Foreground	DC: Colour	Plot
		Texture
		Colour
		Text
		Inverse texture
MISCELLANEOUS		SWITCH
PR: Save and restore		SP: Points
EX: Control colour scheme		ST: Texture
MI: Wipe sketch clear		SC: Colour
EM: Enable magnification		SI: Crib
DM: Disable magnification		
AC: Alternative cursor		

Prestel route

**Hardware BBC Prestel Adaptor
Micro BBC B Price £113.85 Sup-
plier Acorn Computers**

Each year in the relatively brief lifespan of the home computing age has had its particular craze or fashion. This year the predominant feature — mice and other furry friends notwithstanding — has to be communications.

A micro without its own modem is somehow lacking.

As ever, third-party manufacturers have latched on to this fact in droves and the BBC B was one of the first machines to benefit from the new add-ons. After all, a micro used so widely in schools, and also marketed as a 'serious' business computer, was a natural target. And, again as ever, BBC's own manufacturer Acorn was well behind in the race to produce its own modem.

Now, however, the Acorn Prestel Adaptor is here and, despite its belated appearance, looks likely to prove a highly attractive add-on for users who want a reliable way of logging on to and making the most of the British Telecom databases.

Unfortunately this modem will only cope with Prestel and, after reconfiguring, the Telecom business service BT Gold. It only operates at 1200/75 baud so anyone also wanting to access any of the bulletin boards which operate on 300/300 baud will have either to get another add-on or try one of the handful of modems designed to cope with multi-baud rates.

Connecting it up to the micro is relatively simple unless, like me, you have used other modems. For some reason the Acorn RS432 interface has to be plugged in exactly the

opposite way round to all other models, I have tried.

Once connected, with the Prestel Rom in your micro and the modem switched on with its BT jack in the appropriate socket, the opening screen gives you a summary, along the bottom lines, of the available options via the function keys. This can be called on-screen at any time during operation. Logging on to Prestel simply involves keying in the telephone number and letting the adaptor dial it and link up for you. You can key in special characters for pauses between figures, but I found no problem in simply typing in the number alone. Prestel (and/or Micronet 800) members will then be asked to key in their passwords and can enter the database.

Of course any modem should get you this far, although this system is a great deal more convenient than having to plug a telephone into the modem itself. But it is in the facilities available while using Prestel, that the Acorn machine really scores.

The most obvious of these additional facilities is in the ever-sensitive area of down-loading software, a major attraction to home micro users. Not once in a lengthy series of down-loading programs over the review period was there any hitch in the proceedings. On screen instructions were always crystal clear and programs loaded, saved to disc and ran perfectly every time. This is not, sadly, a general rule when down-loading software.

One of the other major attractions of the Prestel system is its 'mailbox' facility, which allows users to send messages to each other. These can range from straight-forward text, to the use of different colours

and varieties of text, to a complex set of available graphics. Using the function keys, the Prestel software enables relatively easy use of the colour and graphics in mailboxes and, via an 'edit frame' facility, makes it possible to design a complex mailbox whilst still off-line (and therefore not running up a massive phone bill). It also allows the saving and loading of individual screens or 'frames' from the database.

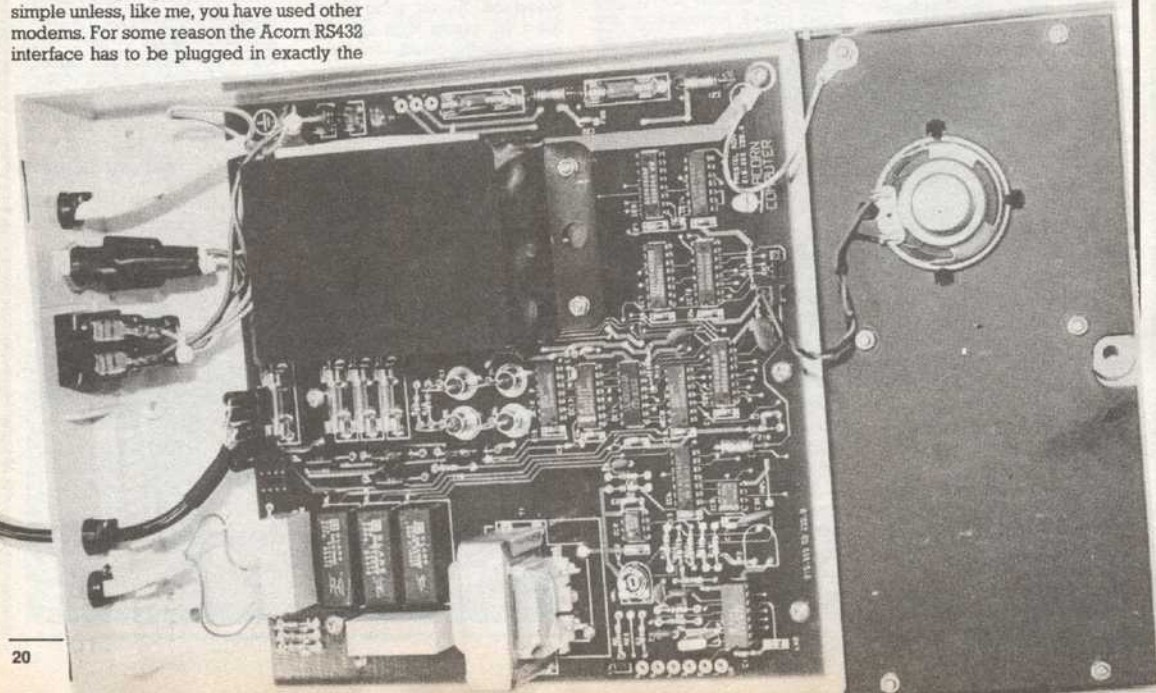
If, like me, you need to do quite a bit of experimenting before you can get the right effect with graphics, these facilities are invaluable. Unfortunately, unlike the infallible software for down-loading, I couldn't get the off-line screen editor to work properly. Frames appeared to be saved perfectly happily, but calling them back on-screen, using the apparently fool-proof instructions in the manual, proved a task beyond my powers. Perhaps just an individual quirk in the adaptor, or even my micro, but an annoying one.

That apart, my relationship with the Prestel adaptor was a wholly friendly one and much attention has been paid to making the on-screen prompts as idiot-proof as possible.

When the frame loading and editing facilities work properly it is also possible to use the *Menu* function for your own reprogramming, for example, by instructing the *Help* key to give special prompts on particular areas.

In all, a package well worth considering for any BBC user wanting to go the Prestel route, but not having a 300 baud facility could — depending on what you want to do — prove a drawback.

Barbara Conway



Rom wasn't built in a day

Taking another look. **Andrew Pennell** compares the present AH and JM version QLs with the previous FB and PM variants.

The QL's somewhat premature launch forced the release into the world of SuperBasic version FB, which was incredibly bug-ridden.

Considering the machine arrived some four months late, there was obviously insufficient time to test the Basic and the job was left to customers. To see which version you have, type *Print Ver\$*. The original was FB, then PM, and the latest and final (for the moment) versions are AH and JM. The weird names are initials of certain members of Sinclair staff.

The first version of SuperBasic, FB,

same name as another variable.

Trying to read ZX cartridges will crash the machine.

Pressing *Ctrl Alt 7* will lock it up.

In addition, the *At* command works differently on different QLs. Version AH works as stated in the manual, but FB requires its parameters the other way around.

That said, AH is a big step forward. As well as correcting most of the bugs, AH machines operate rather differently. The terrible line editor in the earliest machines

Sorry David, but the Macintosh manages to do the same, but with proportional spacing on screen and different character heights, at a much faster rate, and it uses the similar 68000 processor. The latest version of *Quill* that I have seen still ignores the 'lines per page' setting you give it, so if you haven't got 66 lines per page, well too bad! A new *Quill* is on the way.

Updated versions of the Psion software will be available during October/November, free of charge to QLUB members. The programs may also be available on a whopping Rom cartridge, but there seems to be some confusion about when this may become available.

Multi-tasking on the QL is still shrouded in mystery, as it cannot be done from Basic. I can see from the system tables how it should be possible, but doing it in practice has proved impossible so far.

There seems no possible justification for the non-standard joystick sockets.

It seems Sinclair has as much difficulty finding plugs to fit the QLs weird sockets as everyone else.

I have yet to use a QL satisfactorily with a colour television. After warming up, the colour signal goes, and only constant retuning can get it back, so I don't bother any more. The QL is also incompatible with many makes of monitor because the video signal does not conform to the industry standard. Its all very well to use a non-standard video socket, but a non-standard signal too! Some monitors do work though, namely Sanyo ones, as shown on the Sinclair stand at Earls Court recently. It would seem that Sinclair are going to put their name on someone's monitor especially for the QL, but so far I don't know whose.

The list of coming peripherals is much as it was at the launch, with priority going to a 128K Ram pack, and no mention of a floppy disc interface. The need for a Centronics interface has disappeared since the launch of the Miracle Systems one (reviewed in June 28 issue) and other serial to parallel converters can be expected from other suppliers. There is still no sign of individual QL Microdrives or the 512K Ram pack.

The inner workings of QDOS are to be published shortly, but it does not seem to be intended for enthusiasts as it will cost around £25. The provisional documentation I have seen contains a wealth of information, but is written in such a way as to be as difficult to understand as possible.

At last the QL is beginning to mature, and it is to be hoped that the bad publicity surrounding its launch will not lessen, to any great extent, its impact on the market.

Sinclair continues to deny any development of a floppy disc interface, which would be the one product to really take the QL into the market it is aimed for.

Nevertheless the AH and JM versions are a big improvement and much more the machine that everyone was talking about after its launch in January.



is the one that I was supplied with and I soon realised something was amiss when all of my first Basic programs kept crashing the machine. Only after a lot of trial and error, and pressing *Reset*, did the causes make themselves apparent. Phoning Sinclair to try and get a list of known bugs produced the response "there is something wrong with *Beep*", but nothing else. To aid those who also have FB machines, here is a list of all the bugs subsequently corrected in later versions, so they can be avoided.

String variables — referencing an undefined string will crash the machine, eg *Print z\$(2)*

Local variables — in functions these tend not to work, producing strange values, and local *For* loops can crash the machine.

SDate — if any parameters are undefined the machine will crash.

Call — if any parameter is a string it will crash.

Arithmetic — *Print -2 - 2* gives 0 instead of -4, and so does any power of 2. Also, creating large numbers can crash it.

Network — the network will not communicate with a Spectrum.

Beep — apparently one of the parameters doesn't do anything — I don't know any more.

Unfortunately, the latest version, AH, whilst being a considerable improvement, still suffers from some other bugs:

Variables — an array cannot be the

has been replaced with rather a neat one, which no longer throws bad lines out, but lets you re-edit them. You can also go up and down the program, line by line, as on the Spectrum. The character set has also been extended, to include all sorts of foreign characters, and even a few graphics, all accessible from the keyboard. The Microdrive code has also been altered, but I'm not sure to what effect.

The opportunity to add extra features when the AH version was written was not fully taken up, as the very terse error messages have not been extended. Despite being described by David Karlin — the machine's hardware designer — as "helpful", the error messages are just as unilluminating in AH as they are in FB. The worst is "error in expression", which covers around seven different types of error, making debugging very frustrating. AH also prints up messages while programs actually run, such as "*Procs/Fn cleared*", and "bad or changed medium". The meaning of these is not documented.

The present manual is beset by a considerable number of misprints, with precious few of the listings correctly typeset. It is also inaccurate and misleading in places but it is to be revised in August. Those who have a dongle hanging out of the back of their machines can hope to have them upgraded by the end of August. This will take ten days.

Psion's programs exist in many variants, even more than the number of versions of SuperBasic. *Quill* is still tediously slow, though David Potter claims it is good considering that it is a real-time formatter."

Picture window

Looking out on another world. **Adrian Warman** — in the first of a two-part article — gives your Commodore 64 'windows'.

One of the facilities of machines like the Lisa or Macintosh which is often taken as synonymous with mice is that of 'windows'.

Strictly, these are any number of small text or graphic screens — or windows — which exist independently of the main screen or from each other. They may seem to 'overwrite' anything displayed underneath, but when the window is removed, the underlying display is restored undamaged. The program below provides a form of primitive window facility for the standard Commodore 64 computer. It works for the text screen only, but could be adapted to work for a high-resolution screen.

Next week we will print the Basic Loader version of the program for those without an assembler. For this week — a description of the program and the first part of the assembly language listing.

The following features are implemented in the windowing program:

The standard text screen can be anywhere in memory prior to storage of a subsection of screen or before restoring; as long as the system variable *Hibase* (at \$0288) is correctly set up. In other words, if any display screen can be used from Basic,

it can also be stored and updated.

Windows are stored in a 'stack' fashion, ie the last window stored will be the first retrieved.

All windows can be from any subsection of the screen, of any size. A special option for the entire screen to be stored is also provided.

The windows are stored 'behind' the Basic Roms from locations \$A000 to \$BFFF. This results in small loss of user-memory for storage purposes. Memory space is utilised to a maximum. Smaller windows require less storage space, and so more of them can be held.

Both character and colour data is kept.

Any attempt to store a window for which there is insufficient space will cause an error message.

Attempts to retrieve a screen when none is stored will be ignored.

To install the program once you have loaded it in, simply load and run the Basic loader program. If the loader program is incorrectly entered, and error message will be produced, otherwise the loader will stop when all the data has been correctly loaded. To activate the window facilities, perform a *SYS 49152* either in direct or

program mode.

If you wish to store an entire screen, simply use *SYS 49161*.

To store a section of the screen, use the instruction: *SYS 49155,x,xs,y,ys* where *x* is the column number of the left-hand side of the window, in the range 0 to 39 inclusive. The program refers to this as 'XORIG'. *xs* is the width of the window in columns, in the range 0 to 40 inclusive. A width of 0 will cause no storage. The total of *x* and *xs* must not exceed 40, or else an error will be generated. The program refers to *xs* as 'XSIZE'.

y is the row of the top side of the window, in the range 0 to 24 inclusive. The program refers to this as 'YORIG'.

And *ys* is the depth of the window in rows, in the range 0 to 25 inclusive. A depth of 0 will cause no storage. The total of *y* and *ys* must not exceed 25, or else an error will be generated. The program refers to *ys* as 'YSIZE'.

To retrieve the last window stored (if any) use 'SYS 49158'. The window will be returned to its original position on the screen. See the example sub-routine to be printed in the second part.

Printed next week — in the final part of 'Windowing on the C64' — will be the remainder of the assembly-language listing, a Basic loader version of the windowing program and a simple example program to demonstrate windowing at work.

Program Notes

1090-1190 The storage area used by the program for transferring screen data 'to and fro'. *SRC* and *VEC* are vectors for transferring data to and from the storage area. *SRC* is used to point to the screen (or colour nybble map) area, while *VEC* points to the next free location behind the Basic Roms.

1240-1260 A simple jump table to make the *SYS* command numbers easier to remember.

1270-1340 This is the command to store the entire screen. This behaves exactly as the normal store command, except that the dimensions of the window are already known. Accordingly, the default values are set up and a jump made directly into the store routine.

1380-1420 Initialises the vector indicating the next free storage position. When first used, the vector points to the first address of the Basic Roms. At any time, re-initialising will cause the loss of all windows currently stored.

1460-1580 A general routine for multiplying the

contents of the *Y* register by 40. The result is placed into the store called *Temp* for convenience.

1620-1700 On a couple of occasions, the value *YORIG* needs to be found — this is the position of the top left-hand corner of the window, relative to the top left-hand corner of the screen. The routine returns the position in *Temp* using the multiplication routine described above.

1740-1790 For the general-purpose store routine, it is necessary to find the dimensions of the window. This sub-routine will find and calculate each of the dimensions after the *SYS* command. Any value greater than 255 will immediately cause an error. Checks for the values smaller than this are made in the store routine itself.

1810 Any values out of range or an attempt to store a window for which there is insufficient space will produce an illegal value error message, using this jump instruction.

1850-1910 The store routine. Finds the XORIG of the window. Cannot exceed a value of 39.

1920-1980 Finds the XSIZE of the window. The total of XORIG and XSIZE cannot exceed 40 (the width of the screen).

1990-2020 Finds the YORIG of the window. Cannot exceed a value of 24.

2030-2060 Finds the YSIZE of the window. The total of YORIG and YSIZE cannot exceed 25 (the depth of the screen).

2070-2090 Checks to see if there is sufficient room for the new window. At present, it is not known how large the window is, so a default size of the entire screen is assumed. If there is not enough space behind the Roms, the command will abort with an error message. To estimate the storage space left, use: *Print 47104 - Peek (253) + 256 * Peek (254)*. Each window takes up $2 * (\text{rows} * \text{cols}) + 4$ locations, where *rows* is the number of rows in the window, and *cols* is the number of columns.

```

1000 C000  **$C000
1010 C000  !
1020 C000  ! SCREEN STORE PROGRAM.
1030 C000  !
1040 C000  ! BY A. WARMAN.
1050 C000  !
1060 C000  !
1070 C000  ! DEFINE PROGRAM VARIABLES.
1080 C000  !
1090 C000  CALC      = $02
1100 C000  TEMP      = $B8
1110 C000  TEMPHI    = $BC
1120 C000  XORIG     = $F7
1130 C000  XSIZE     = $F8
1140 C000  YORIG     = $F9
1150 C000  YSIZE     = $FA
1160 C000  SRC       = $FB
1170 C000  SRCHI    = $FC
1180 C000  VEC       = $FD
1190 C000  VECHI    = $FE
1200 C000  !

```

```

1210 C000  !
1220 C000  ! PROGRAM VECTORS.
1230 C000  !
1240 C000  4C1AC0 INIT      JMP START
1250 C003  4C5BC0 STOR      JMP STORE
1260 C006  4CC7C0 UPDT      JMP UPDATE
1270 C009  A900  SCRIN      LDA #000
1280 C00B  85F7  STA XORIG
1290 C00D  85F9  STA YORIG
1300 C00F  A928  LDA #28
1310 C011  85F8  STA XSIZE
1320 C013  A919  LDA #19
1330 C015  85FA  STA YSIZE
1340 C017  4C87C0 JMP STRSCRN
1350 C01A  !
1360 C01A  ! INITIALISE PROGRAM.
1370 C01A  !
1380 C01A  A900  START      LDA #000
! START MEMORY VECTOR.
1390 C01C  85FD  STA VEC

```


1400 C01E A9A0	LDA ##A0	1770 C053 C900	CMP ##00
1410 C020 85FE	STA VECHI	1780 C055 D001	BNE BADVAL
1420 C022 60	RTS	1790 C057 60	RTS
1430 C023	!	1800 C058	!
1440 C023	! CALCULATE PRODUCT *40.	1810 C058 4C48B2 BADVAL	JMP #B248
1450 C023	!	!	! ILLEGAL VALUE.
1460 C023 8402	MULY	1820 C05B	!
!	! MULTIPLY Y*40.	1830 C05B	! STORE SCREEN.
1470 C025 A900	LDA ##00	1840 C05B	!
1480 C027 A208	LDX ##08	1850 C05B 204AC0 STORE	JSR GETVAL
1490 C029 4602	LSR CALC	!	! FIND XORIG.
1500 C02B 9003	BCC SKIP	1860 C05E C02B	CPY ##2B
1510 C02D 18	CLC	1870 C060 B0F6	BCS BADVAL
1520 C02E 6928	ADC ##2B	1880 C062 84F7	STY XORIG
1530 C030 6A	RDR A	1890 C064 204AC0	JSR GETVAL
1540 C031 668B	RDR TEMP	!	! FIND XSIZE.
1550 C033 CA	DEX	1900 C067 84F8	STY XSIZE
1560 C034 D0F3	BNE NEXT	1910 C069 9B	TYA
1570 C036 858C	STA TEMPHI	1920 C06A 18	CLC
1580 C038 60	RTS	1930 C06B 65F7	ADC XORIG
1590 C039	!	1940 C06D C929	CMP ##29
1600 C039	! FIND YORIG*40+XORIG.	1950 C06F B0E7	BCS BADVAL
1610 C039	!	1960 C071 204AC0	JSR GETVAL
1620 C039 A4F9	POSN	!	! FIND YORIG.
1630 C03B 2023C0	LDY YORIG	1970 C074 C019	CPY ##19
1640 C03E A58B	JSR MULY	1980 C076 B0E0	BCS BADVAL
1650 C040 18	LDA TEMP	1990 C078 84F9	STY YORIG
1660 C041 65F7	CLC	2000 C07A 204AC0	JSR GETVAL
1670 C043 858B	ADC XORIG	!	! FIND YSIZE.
1680 C045 9002	STA TEMP	2010 C07D 84FA	STY YSIZE
1690 C047 E68C	BCC POSNOUT	2020 C07F 9B	TYA
1700 C049 60	INC TEMPHI	2030 C080 18	CLC
1710 C04A	RTS	2040 C081 65F9	ADC YORIG
1720 C04A	!	2050 C083 C91A	CMP ##1A
1730 C04A	! FIND VALUE.	2060 C085 B0D1	BCS BADVAL
1740 C04A 20FDAE	GETVAL	2070 C087 A5FE	LDA VECHI
!	! FIND NEXT NUMBER.	2080 C089 C9B8	CMP ##B8
1750 C04D 20BAAD	JSR #A8DA	2090 C08B B0CB	BCS BADVAL
1760 C050 20F7B7	JSR #B7F7		

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Everyday routines

Jason Orbaum and Geoffrey Campbell continue their series with a library of useful machine code routines.

There are many people who would like to write assembler programs, but who either do not want to go to all the effort of writing the code for each little routine, or simply do not know how to write some of the routines required. For this reason we're printing a 'library' of basic machine code routines common to many games and other kinds of program. Some of them will also be useful from Basic, for example the screen scrolling routines. All of them are written in fully relocatable code, and can therefore be placed anywhere in Ram, to suit the user's current requirements.

To reposition any routine, simply change the clear statement to the start address and change the *For-Next* loop by a corresponding amount in the Basic loader program (or use the *ORG* pseudo-op if you are working from an assembler). It is possible to have as many routines as memory permits in Ram all at once using this technique.

We shall start with a few simple routines, to fill the screen with a given character, and invert the screen. The screen fill must have the A and B registers initiated, so a small machine code driver to set up the values is needed, which we will leave to your imagination! Any character can be used, and, by using character 143, the screen can

be cleared. To call this routine, use something like:

```
LDA #143
LDB #143
BSR CLS
      or, for black,
LDD #$8080
BSR CLS
```

The routine is as efficient as possible, using the D register to fill two screen locations at a time. The first line sets up the X register to point to hex 400, the first location of the screen memory. Then we come to the first part of the main loop, which stores the two characters on the screen, at the location held in the X register, and also adds two to the X register. The routine then compares the X register with hex 600, which is the bottom of the screen Ram. If it is lower (Branch on Lower) then the routine branches back and fills in the next two screen locations. Otherwise, it returns to the driver program.

The screen inverter works in much the same way, but the D register is first loaded from the screen positions in question, and then the A and B registers are exclusive ORed with 64. Some of you may have used a similar method from Basic, subtracting/

added 64, and using exclusive OR does the same, but will also convert from inverse to normal. The routine will invert text, but you will get some funny effects with other characters! This routine can be called straight from Basic, with *Exec 10001*, or whatever start address you choose.

The vertical scroll routines are similar in construction to the two previous ones, but, instead of changing the data at a location, it changes the location at which the data is stored, by loading from the address in one index register (the Y register), and storing it in the address in the other (the X register). The routines used double auto-increment and -decrement modes for the index registers. These can also be called straight from Basic.

Now we come to the horizontal scrolls. These are a little more difficult to understand if written in their most efficient form and have therefore been simplified. An explanation follows for the scroll left routine and the scroll right should then be easy to understand. *Loop2* involves scrolling one line of B characters to the left. This loop is nested in *Loop1* which scrolls the last one character, and then repeats this for A lines. Note the use of the stack to conserve A and B whilst the loop continues. The scrolls left and right can be called from Basic.

All of these scrolls duplicate the edge line on the screen and this can then be filled with the appropriate string of characters (perhaps part of the caves in a game of *Scramble* or the next row of figures to be moved onto a spreadsheet window).

Next week Beep, Zap and Bang with the best of them with Dragon machine-code sound.

```
2711      *
2711      * FILL SCREEN WITH ANY
2711      * CHARACTER
2711      * CALL SUBROUTINE WITH
2711      * CHARACTER
2711      * IN BOTH A AND B REGISTERS.
2711      *
2711      CLS      LDY    #$400
2714 ED01      LOOP   STD     ,X++
2716 8C0600      CMPL   #$600
2719 25F9      BLO     LOOP
271B 39      RTS
271C
```

BASIC LOADER PROGRAM.

```
0 REM SCREEN FILL
5 CLEAR 200, 10000 :CS=0
10 FOR N=10001 TO 10012
20 READ A#
30 A=VAL("&H"+A#)
40 POKE N,A
50 CS=CS+A
60 NEXT N
70 IF CS< 1958 THEN SOUND 1,1,PRINT
"DATA ERROR." END
80 PRINT"ALL CORRECT":SOUND 200,1,END
90 DATA 8E,4,0,ED,81,8C,6,0,25,
F9,39,39,0
```

```
2711      *
2711      * SCREEN TEXT INVERT
2711      *
2711      8E0400      INVERT LDY    #$400
2714 EC84      LOOP   LDD     ,X
2716 8840      EORA   #64
2718 C840      FORB   #64
271A ED01      STD     ,X++
271C 3C0600      CMPL   #$600
271F 25F3      BLO     LOOP
2721 39      RTS
2722
```

BASIC LOADER PROGRAM.

```
0 REM SCREEN TEXT INVERT
5 CLEAR 200, 10000 :CS=0
10 FOR N=10001 TO 10018
20 READ A#
30 A=VAL("&H"+A#)
40 POKE N,A
50 CS=CS+A
60 NEXT N
70 IF CS< 1984 THEN SOUND 1,1,PRINT"DATA
ERROR." END
80 PRINT"ALL CORRECT":SOUND 200,1,END
90 DATA 8E,4,0,EC,84,88,40,C8,40,ED,81,
8C,6,0,25,F3,39,39,0
```

```
2711      *
2711      * SCROLL SCREEN UP
2711      *
2711      8E0400      SCROLL1 LDY    #$400
2714 10E0420      LDY    #$420
2716 EC81      LOOP   LDD     ,Y++
2718 ED01      STD     ,X++
271A 10E0600      CMPL   #$600
271C 25F6      BLO     LOOP
271F 39      RTS
2722 39
2723
```

BASIC LOADER PROGRAM.

```
0 REM SCROLL UP
5 CLEAR 200, 10000 :CS=0
10 FOR N=10001 TO 10019
20 READ A#
30 A=VAL("&H"+A#)
40 POKE N,A
50 CS=CS+A
60 NEXT N
70 IF CS< 1662 THEN SOUND 1,1,PRINT
"DATA ERROR." END
80 PRINT"ALL CORRECT":SOUND 200,1,END
90 DATA 8E,4,0,10,8E,4,20,EC,81,ED,81,
10,8C,6,0,25,F6,39,39,0
```



```

2711      # SCROLL DOWN
2711      #
2711      8E0622  SCROLL2 LDX  #9622
2718  ECR3    LDX  #9602
2718  ECR3    LOOP  LDD  ,--Y
2718  ED83    STP  ,--X
271C  10C03FE CMPY  #93FE
2720  22F6    RMI  LOOP
2722  39      RTS
2723

```

BASIC LOADER PROGRAM.

```

0 REM SCROLL DOWN
5 CLEAR 200, 10000 :CS=0
10 FOR N=10001 TO 10019
20 READ A#
30 A=VAL("SH"+A#)
40 POKE N,A
50 CS=CS+A
60 NEXT N
70 IF CS<> 1922 THEN SOUND 1,1:PRINT
  "DATA ERROR." :END
80 PRINT"ALL CORRECT" :SOUND 200,1:END
90 DATA 8E,6,22,10,8E,6,2,EC,A3,ED,83,
  10,8C,3,FE,22,F5,39,39,0

```

```

2711      # SCROLL RIGHT
2711      #
2711      8611  SCROLL4 LDA  #17

```

```

2713 8E041F  LDX  #941F
2716 108E041E LDX  #941E
2718 C60F    LDB  #15
271C 3406    LOOP1 LDB  #15
271C 3406    LOOP2 LDB  #15
271E ECR3    LDD  ,--Y
2720 ED83    STD  ,--X
2722 3506    PULS  D
2724 5A      DECB  D
2725 26F5    BNE  LOOP2
2727 E6A3    LDB  ,--Y
2729 E793    STB  ,--X
272B 64,X    LEAB  64,X
272E 31A840  LEAY  64,Y
2731 4A      DECB  D
2732 26E6    BNE  LOOP1
2734 39      RTS
2735

```

BASIC LOADER PROGRAM.

```

0 REM SCROLL RIGHT
5 CLEAR 200, 10000 :CS=0
10 FOR N=10001 TO 10037
20 READ A#
30 A=VAL("SH"+A#)
40 POKE N,A
50 CS=CS+A
60 NEXT N
70 IF CS<> 3730 THEN SOUND 1,1:PRINT
  "DATA ERROR." :END
80 PRINT"ALL CORRECT" :SOUND 200,1:END
90 DATA 86,11,8E,4,1F,10,8E,4,1E,C6,F,34,
  6,EC,A3,ED,83,35,6,5A
100 DATA 26,F5,E6,A3,E7,83,30,88,40,31,A8,
  40,4A,26,E6,39,39,0

```

```

2711      # SCROLL LEFT
2711      #
2711      8610  SCROLL3 LDA  #16
2713 8E0400  LDX  #9400
2716 108E0401 LDX  #9401
2718 C60F    LDB  #15
271C 3406    LOOP1 LDB  #15
271C 3406    LOOP2 PSHS  D
271E ECR3    LDD  ,Y++
2720 ED81    STD  ,X++
2722 3506    PULS  D
2724 5A      DECB  D
2725 26F5    BNE  LOOP2
2727 E6A1    LDB  ,Y++
2729 E781    STB  ,X++
272B 4A      DECB  D
272C 26ED    BNE  LOOP1
272E 39      RTS
272F

```

BASIC LOADER PROGRAM.

```

0 REM SCROLL LEFT
5 CLEAR 200, 10000 :CS=0
10 FOR N=10001 TO 10031
20 READ A#
30 A=VAL("SH"+A#)
40 POKE N,A
50 CS=CS+A
60 NEXT N
70 IF CS<> 3138 THEN SOUND 1,1:PRINT
  "DATA ERROR." :END
80 PRINT"ALL CORRECT" :SOUND 200,1:END
90 DATA 86,10,8E,4,0,10,8E,4,1,C6,F,34,
  6,EC,A1,ED,81,35,6,5A
100 DATA 26,F5,E6,A1,E7,81,4A,26,EC,
  39,39,0

```

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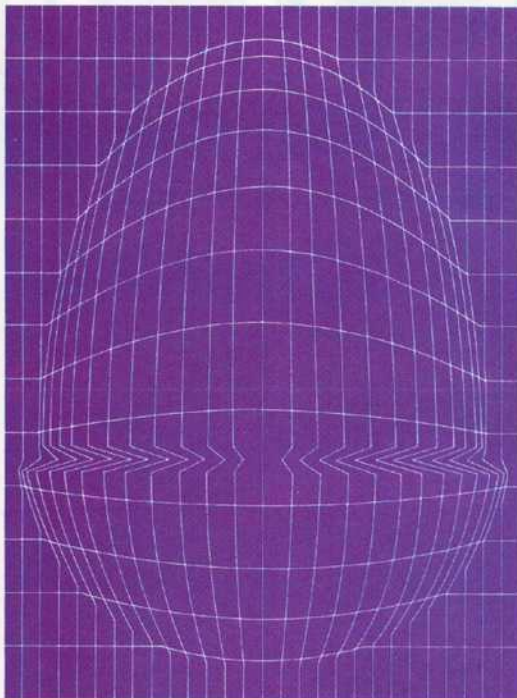
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The last chapter

The fifth and final part of **Alan Macdonald's** machine-code adventure writing series

This week sees the final part of our adventure writing. What I have tried to present you with is a 'skeleton' program, which you can use to write your own adventures around. This week's assembler listing is divided up into two parts.

- 1) The cassette and *Quit* routines.
- 2) Routines which deal with our 'mini' adventure.

Saving and Loading

Most adventure games have cassette routines. I find it rather sad and frustrating when no facilities are offered for saving a game on to cassette. There are several ways of saving data on to cassette, the first is to write your own cassette routine. The second, and the easiest, is to call the ROM.

Basically what we want to do is save the important variables on to tape. In fact, the only variables that need to be saved are the ones from X to EXE, the length of the code is therefore 36 bytes long. The following machine code routine saves a headerless block of code on to tape.

```
SAVE LD IX,X      ; IX register holds the base
                  ; address of the code.
LD DE,36          ; DE register pair holds the
                  ; length of the block.
LD A,255          ; indicates a block of code.
CALL #04C2        ; Call the SA-Bytes routine held
                  ; in ROM.
```

If you haven't already noticed, the assembler I have used *Devpac3* (from Hisoft) uses a # number sign (hash) to indicate a HEX number rather than the usual 04C2h. If you do not already own an assembler then I can fully recommend *Devpac*. The package also contains an excellent Monitor.

Note: For further details on the Spectrum Rom, you should consider trying Dr. Ian Logan's and Dr. Frank O'Hara's *Complete Rom disassembly*, Published by Melbourne House.

To reload the code we use the following routine.

```
LOAD SCF          ; set the carry flag indicates
                  ; Load (rather than verify).
LD IX,X           ; again IX holds the start of the
                  ; Code.
LD DE,36          ; and again DE holds the length
                  ; of the block.
LD A,255          ; indicates a block of code.
CALL #0556        ; Call the LD-Bytes routine from
                  ; ROM.
```

If you study this week's assembly listing you will find a routine called *Quit*. This routine simply asks the player if s/he wants another go. If the reply is 'N' then the computer resets.

Note: When you write your own adventures you should always leave behind a little password which allows you to return back to Basic. In the adventure game I have designed it so that pressing B <enter> causes this to happen.

Routines which deal with our 'mini' adventure.

When you write your own adventure game it's important that the program you write is bug-free. All that's left for us to do now is write the routines which deal specifically with the 'mini' adventure.

The routines are as follows:

- 1) Turn the torch on.
- 2) Turn the torch off.
- 3) Fill the bottle with water.
- 4) Unlock the grate.
- 5) Go through the grate.
- 6) Catch the bird.
- 7) Release the bird.

The assembly listing shows how each routine is written. The following section will try to explain, what things need to be considered for each routine.

Turn the torch on.

When the player tries to switch the torch on the following questions or conditions must be met.

- 1) Do you have the torch? If no, print 'You don't have it'
- 2) Is the torch already on? If yes, print 'It's already on.'

Turn the torch off.

Does the player have it?

Is it already on?

Fill the bottle with water.

Is the player at the location where the pool of water is?

Does the player have the bottle?

Is it already full?

Unlock the grate.

Is the player at the location which contains the grate?

Is the grate already open?

Does the player have the keys?

Go through the grate.

Is the player at the location which contains the grate?

Is the grate open?

Catch the bird.

Is the player at the location which contains the bird?

Has the bird already been caught?

Does the player have the cage?

Does the player have the rod? (remember the bird is scared of the rod.)

Release the bird.

Is the player at the location which contains the snake?

Does the player have the bird in the cage?

As you can see it's very important that every possibility is considered, otherwise you will be left with silly anomalies in your program. A classic example of this must be the rope hanging from the tree in Artic's adventure A. When the player has the flint and is at the location which contains the tree it is possible to:

Player — Use flint

Computer — A rope falls to the ground

Player — Use flint

Computer — A rope falls to the ground (sic)

Ditto . . . (forever!)

```
00600 ;
00601 ; Save game to tape:
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10020 : Routine #2
10030 : Turn the torch off:
10040 :
10050 :
10060 :
10070 : OFF LD HL,EXE+2
10080 : CP B.1
10090 : JP NZ,ERR_10
10100 : DEC HL
10110 : CP NZ,ERR_8
10120 : JP (HL),3
10130 : INC HL
10140 : (HL),1
10150 : LD B,23
10160 : JP OUT

```

```

10170 :
10180 : Routine #3
10190 : Fill bottle with water:
10200 :
10210 :
10220 :
10230 :
10240 : FILL LD B,(X)
10250 : CP NZ,ERR_2
10260 : LD HL,EXE+4
10270 : CP B.1
10280 : JP NZ,ERR_11
10290 : DEC HL
10300 : CP NZ,ERR_8
10310 : JP (HL),3
10320 : INC HL
10330 : (HL),1
10340 : JP

```

```

10350 :
10360 : Routine #4
10370 : Unlock the grate:
10380 :
10390 :
10400 :
10410 :
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11490 :
11500 :
11510 :
11520 :

```

```

11250 UNLOCK LD HL,B1
11260 CALL F10
11270 JP NZ,ERR_2
11280 LD B,(X)
11290 CP NZ,ERR_2
11300 LD HL,EXE+7
11310 CP B.2
11320 JP (HL)
11330 LD HL,ERR_12
11340 CP HL,EXE
11350 LD B.1
11360 CP NZ,ERR_13
11370 LD HL,EXE+6
11380 CP (HL),3
11390 INC HL
11400 (HL),2
11410 JP CHL_1

```

```

11420 :
11430 : Routine #5
11440 : Go through the grate:
11450 :
11460 :
11470 :
11480 :
11490 :
11500 :
11510 :
11520 :

```

```

11500 60 LD HL,B1
11510 CALL F10
11520 JP NZ,ERR_2

```

```

11530 LD B,(X)
11540 CP NZ,ERR_2
11550 LD HL,EXE+6
11560 CP B.1
11570 JP (HL)
11580 LD HL,ERR_12
11590 CP B.1
11600 LD B.1
11610 LD B.1
11620 CALL B1
11630 JP F10

```

```

11640 :
11650 : Routine #6
11660 : Catch the bird:
11670 :
11680 :
11690 :
11700 :
11710 :
11720 :
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12210 :
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12230 :

```

```

11700 CATC LD HL,B2
11710 CALL F10
11720 JP NZ,ERR_2
11730 LD B,(X)
11740 CP NZ,ERR_2
11750 LD HL,ERR_10
11760 CP B.3
11770 JP (HL)
11780 LD HL,ERR_2
11790 CP NZ,ERR_9
11800 JP (HL)
11810 LD HL,ERR_15
11820 DEC HL
11830 CP NZ,ERR_16
11840 JP (HL),3
11850 INC HL
11860 (HL),1
11870 LD HL,ERR_1
11880 INC HL
11890 (HL),1
11900 LD HL,ERR_1
11910 INC HL
11920 (HL),1
11930 JP ERR_1

```

```

11940 :
11950 : Routine #7
11960 : Release the bird.
11970 :
11980 :
11990 :
12000 :
12010 :
12020 :
12030 :
12040 :
12050 :
12060 :
12070 :
12080 :
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12100 :
12110 :
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12140 :
12150 :
12160 :
12170 :
12180 :
12190 :
12200 :
12210 :
12220 :
12230 :

```

```

12000 RELE LD HL,B2
12010 CALL F10
12020 JP NZ,ERR_2
12030 LD B,(X)
12040 CP NZ,ERR_2
12050 LD HL,ERR_12
12060 CP HL,EXE+12
12070 LD B.1
12080 CP NZ,ERR_2
12090 LD HL,ERR_1
12100 DEC HL
12110 (HL),1
12120 CP NZ,ERR_2
12130 LD HL,ERR_3
12140 INC HL
12150 (HL),3
12160 LD HL,ERR_3
12170 INC HL
12180 (HL),8
12190 LD HL,EXE+8
12200 LD B.30
12210 JP JP_OUT

```



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Finishing touches

Christopher Bowerman presents the second part of his sophisticated designer program for the BBC.

Last week we looked at how to operate the *Paintbox* program to create pictures and designs. This week, to conclude, looks in more detail at the program itself, and the procedures which make the main program flexible and easy to amend, if you wish.

Paintbox has been used by young children and adults alike, none of whom were computerholics — the system was designed to be fun and easy to use, perhaps within schools. The program runs in only 6K, the main program may look impenetrable and not readily changeable — but because of the use of Procedures it should be easy to extend.

Part one sets up the function keys to have the following ascii values, f0=129, f1=130, f2=131, f3=132, f4=136, f5=134, f6=135, f7=133, f8=138, f9=137. *Procbgnd* puts the Mode 7 Teletext codes for back and foreground down the side of the screen and protects the screen against CIs and scrolls with a text window.

In part two line 10 sets up variables, and line 20 returns to the start prompt contained in *Prograb* when *Escape* is hit. *Procin* sets up screen windows. *Prograb* prompts the user to set up the system, load and save screens or will let the computer set up the system (colours, area and paint density etc).

The infinite loop at line 40 is then entered. *Proccursor* flashes the cursor with *Proccf* and gets the ascii value of a key from the buffer. Depending on the ascii value of the key received a certain Procedure will be called or certain parameters will be altered (ie, the cursor shift position if a cursor control was hit), *Proccursor* then ends and *Procfill* is then called, which checks to see if the back and foreground colours are the same. If they are, the state of flag f is checked. If f is true (-1) no drawing using the brushes takes place and the cursor can move without affecting the display. Otherwise drawing will take place with the brushes.

To add a function to the program a letter will have to be chosen as the command for the new function. For example "W" could be used to call a function to write text at the cursor position. "W" has an ascii value of 87 and if the variable C in *Proccursor* was equal to 87 then a *Proc* (which you had added) then the following line in *Proccursor* would call this *Proc* when "W" was pressed: *If C = 87 Then Proctext-write: Goto 150*. A list of Procedures (list 1) and variables (list 2) follows to help you alter the program to your own requirements.

Fig.1 Procedures

PROCname	Called by	Function
PROC START	M	move cursor to (X,Y) posn.
PROC CUL	G	change background/foreground colours
PROC ADEN	L	change brush size + paint density
PROC S	start prompt S	save screen to tape
PROC LOAD	start prompt L	load screen from tape
PROC POLY	P	draw polygon
PROC T	T	trace a line
PROC E	fkey 5	change between dotted/solid lines
PROC I	I	grid and parallel line drawing
PROC R	R	repeat line
PROC A	fkey 9	triangle area-fill

Fig 2. Variables

Name	Purpose
F,G	current cursor (X,Y) position
U	foreground colour mode of plot in <i>PROCCUL</i>
SS	current foreground colour
C	current background colour
BR	if False (0) paintbrush, if True (-1) airbrush in use
Q%	full-face polygons or take note of R% setting
R%	horizontal/vertical polygons
E%	dotted/solid lines used in line-drawing (<i>PROCT</i> etc)
T% array	last 3 positions visited by triangle-fill
M	background GCOL made outside <i>PROCCUL</i>
A	brush area (paint brush and airbrush)
D	airbrush paint density
M	foreground GCOL mode
C	ascii value of key hit
R	polygon radius
Z%	polygon routine — solid polygons or wire-outlines
P and Q	limits used to set paint and airbrush size


```

220IF G>1023 G=0 ELSE IF G<0 G=1023
230*FX15
240ENDPROC
250DEFPROC FILL:IF F=-1 AND C=128-95 E
NDPROC ELSE IF F=-1 AND C=124-95 ENDPROC
C ELSE IF F=-1 AND C=0 AND SS=4 ENDPROC
260IFA=0 A=10
270IFD=0 D=10
280L=A+S*(L+2)*2:H=S/D:F=L/2:D=G-
L/2:IF BR=0 PROCRRUSH:ENDPROC ELSE PROC
SPRAY:ENDPROC
290DEFPROC SPRAY:FOR I=1 TO S STEP N:X
=RND(L):Y=RND(L):PLOT69,P+X,Q+Y:NEXT:EN
DPROC
300DEFPROCRRUSH:MOVEP,Q:MOVEP+L,Q:PLO
T85,P+L,Q+L:MOVEP,Q+L:PLOT85,P,Q:ENDPROC
C
310DEFPROC SAVE:SAVE P 5A80 7FFF
320VZ=OPENOUT"A":PRINTVZ,N,C:CLOSEVZ
Z:ENDPROC
330DEFPROC LOAD:CLG:LOAD""5A80
340VZ=OPENIN"A":INPUTVZ,N,C:CLOSEVZ
Z:ENDPROC
350DEFPROC POLY:LOCALA,B:INPUT"Fill/U/
V/A":IF A="F" Z=80 ELSE Z=0
360INPUT"SIDE5,R",R:R=2*PI/A:X=F:Y=G
:GCULU,C:PLOT22+4,X,Y:PLOT22+4,X,Y:GCUL
U,SS:FOR C=0 TO 2*PI STEP B
370IF D=0 PLOT22+1,COS(C)*R,SIN(C)*R
ELSE IF R=0 PLOT22+1,COS(C)*R/2,SIN(C
)*R ELSE IF R=-1 PLOT22+1,COS(C)*R,SIN
(C)*R/2
380IF A="F" PLOT22+5,X,Y
390NEXT:ENDPROC
400DEFPROC CF:FOR JX=0 TO 1:GCUL3,3:MOVEF
-2,G-2:MOVEF+2,G-2:PLOT85,F-2,G+2:PLOT8
5,F+2,G+2:NEXT:GCULU,SS:ENDPROC
410DEFPROC TX:AZ=F:BZ=G:FZ=1:PLOT69,AZ,

```

```

BZ:REPEATPROC CURSOR:UNTIL C=13:CZ=F:DZ=
G:GCULU,SS:MOVEAZ,BZ:PLOT69+5,CZ,DZ:END
PROC
420DEFPROC EX:IF EX=0 EX=1A ELSE EX=0:E
NDPROC
430PROC CURSOR:ENDPROC
440DEFPROC I:XZ=F:CZ=Y:YZ=G-DZ
450AZ=A+X:YZ=B+Y:CZ=C+X:YZ=D+Y
Z:MOVEAZ,BZ:PLOT69+5,CZ,DZ:IF GET=32 GO
TO450 ELSE ENDPROC
460DEFPROC F:AZ=G:BZ:PROCT:ENDPROC
470DEFPROC TX:TX(1,1)=F:TX(1,2)=G:FOR TX
=2 TO 3:PLOT69,F,G:REPEAT:PROC CURSOR:UNTIL
C=13:TX(TX,1)=F:TX(TX,2)=G:NEXT:FOR TX
=1 TO 2:MOVE TX(TX,1),TX(TX,2):NEXT:PLOT85
+TX(3,1),TX(3,2):ENDPROC
480MODES:U=0:SS=0:C=0:F=-1:A="":BR=0
:AN="":OZ=0:RZ=-1:EX=0:DINTZ(3,2):IN=0
200ERROR PROCGRAB
30PROC INIT:IF A<>"M" PROCGRAB
40PROC CURSOR:PROCT:ILL:GOTO40
50DEFPROC INIT:VDU24,0;0;1279;960;28,
0,1,19,0:ENDPROC
60DEFPROC GRAB:INPUT"Set up Y/N/O/S/L
",A:IF A="M" GOTO70 ELSE IF A="O" EN
D ELSE IF A="N" PROCSTART:PROCCL:PROC
ADEN:ENDPROC ELSE IF A="L" PROCLOAD:EL
S E IF A="S" PROC SAVE
70A=S:D=7:F=500:G=500:H=0:SS=4:C=0:E
NDPROC
80DEFPROC START:INPUT"X,Y",T,U:IF T=
"="S" OR U="="S" ENDPROC ELSE IF VAL(T)<
0 ENDPROC ELSE F=VAL(T):B=VAL(U):ENDP
ROC
90DEFPROC CL:INPUT"Bgnd mode Col,Mix
,Uipe":IF M="C" A=0 ELSE IF M="M" M
=1 ELSE IF M="U" M=2 ELSE IF M="S" M
=0 TO10 ELSE M=VAL(M)

```

```

100INPUT"Bgnd f1-3":IF ASC(C) >127
C=ASC(C):GCULN,C:CLG ELSE C=VAL(C):G
CULN,C:CLG
110INPUT"FGND Col,Mix,Uipe",T:IF T=
"="U=0 ELSE IF T="M" U=1 ELSE IF T="
"U" U=2 ELSE IF T="S" ENDPROC ELSE U=VA
L(T)
120GCULU,1:ENDPROC
130DEFPROC ADEN:INPUT"Area,Den",T,U:
IF T="="S" OR U="="S" ENDPROC ELSE IF VAL
(T) <0 ENDPROC ELSE A=VAL(T):D=VAL(U)
:ENDPROC
140DEFPROC CURSOR
150PROC CF:C=INKEY(0)
160IF C=13:ENDPROC ELSE IF C=134 PROC
E:GOTO150 ELSE IF C=84:PROC ELSE IF C=
135 F=NOT F:GOTO150 ELSE IF C=133 G=NOT
G:GOTO150 ELSE IF C=138 RZ=NOT RZ:GOTO1
50
170IF C=3 VDU16 ELSE IF C=73 PROC I:GOT
O150 ELSE IF C=74 PROCADEN:GOTO150 ELSE
IF C=80 PROC POLY:ENDPROC ELSE IF C=82
PROC R:GOTO150 ELSE IF C=136 BR=NOT BR:GO
TO150 ELSE IF C=71 PROCCL
180IF C=77 PROCSTART:GOTO150 ELSE IF
C > 127 AND C < 137 C=C-128:GCULN,C:SS=
C:GOTO150 ELSE IF C=65 F=F+A/5:GOTO210
190IF C=68 F=F+A/5:GOTO210 ELSE IF C=88
S=S+A/5:GOTO210 ELSE IF C=87 S=S+A/5:G
OTO210 ELSE IF C=67 F=F+(A+5)/2:G=6+(A
+5)/2:GOTO210 ELSE IF C=137:PROCADEN:GOTO1
50
200IF C=81 F=F-(A+5)/2:G=6+(A+5)/2:GO
TO210 ELSE IF C=90 F=F-(A+5)/2:G=6-(A+5
)/2:GOTO210 ELSE IF C=67 F=F+(A+5)/2:G=
6-(A+5)/2:GOTO210 ELSE IF C=83 GOTO210
ELSE GOTO150
210IF F>1279 F=0 ELSE IF F<0 F=1279

```



Commodore 64



VIC-20



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Open Forum

Sandy Shore

on Spectrum

Following the publication of *Garden in Popular Computing Weekly* is seemed that there may be some public interest in active pictures for microcomputers. This one shows a random headland and island, together with waves breaking upon a sandy shore. The scene changes every so often.

Such pictures could be used as sales points in shops, restaurants and other commercial premises. Very crude machines giving a moving text message sell for well over the cost of a 16K Spectrum.

Program notes

- Lines 1 to 232 Are initialisation and a short subroutine to generate a random character $r\$$ which is either a underline or a space.
- Lines 10 to 20 Set the horizon and draw in the headland.
- Lines 180 to 230 Draw in the island.
- Line 232 Prints the shore. The f should be #.
- Lines 250 to 300 Are the waves.
- Lines 250 to 284 Set them up.
- Lines 255 to 300 Keep them lapping for 100 cycles.
- Line 310 Repeats the program with another scene.
- Line 999 Is a line to re-set the ink and paper to suitable colours for program development.

```

1 GO TO 100
10 LET r$=" ": IF RND<.3 THEN
LET r$=" "
20 RETURN
50 REM "Sandy Shore" is (c)
Reeves Telecommunications Labor-
atories Ltd 1982.
100 BORDER 7: PAPER 1: CLS
101 RANDOMIZE
102 DIM a$(5,32)
104 FOR n=1 TO 5: LET a$(n)=""
110 LET horizon=7*RND
120 LET pointstart=40*RND+120
131 LET pointend=16*RND+70
140 FOR n=0 TO horizon: PRINT A
T n,0: PAPER 5:
" : NEXT n
145 FOR n=1 TO RND*20+34
150 PLOT 0,pointstart-n: DRAW
INK 4,pointend,0
160 LET pointend=pointend+RND*4
170 NEXT n
180 LET islandx=RND*100+50
190 LET islandy=RND*(140-8*hor
izon)+40
191 LET islandinc=RND*10
200 FOR f=1 TO 10+10*RND

```

```

210 PLOT islandx, islandy-f: DRA
W INK 4: islandinc,0
220 LET rand=RND*10: LET island
x=islandx-rand: LET islandinc=is
landinc+rand+RND*10
230 NEXT f
232 PRINT £1: AT 0,0: PAPER 6:
240 REM waves
250 FOR n=1 TO 5
252 FOR f=1 TO 32: GO SUB 10: L
ET a$(n,f)=r$: NEXT f
254 NEXT f: NEXT n
255 FOR h=0 TO 100
260 FOR n=17 TO 21: PRINT BRIG
HT 1: AT n,0: INK 7: a$(n-16): BEE
P .005,0.001: NEXT n
290 FOR n=5 TO 2 STEP -1: LET a
$(n)=a$(n-1): NEXT n
295 FOR f=1 TO 32: GO SUB 10: L
ET a$(1,f)=r$: NEXT f
300 NEXT h
310 RUN
999 BORDER 7: PAPER 7: INK 0

```

Sandy Shore
by John de Rivaz

Microradio

GW6JJN



Morse the pity

There is news this week regarding a new improved Radio Teletype Interface for the Spectrum computer which incorporates all that is required to operate RTTY with the Spectrum. The interface and the driving software have been developed in conjunction with the Sinclair Amateur Radio Users Group (SARUG) at 3 Red House Lane, Leiston, Suffolk. Please enclose a stamped addressed envelope if you want a reply. The interface is available either complete or as a printed-circuit board and instructions. Since I am in the

process of constructing one, I will say no more for now and bring you a blow-by-blow account of the construction as well as a full review of the unit in use. It looks like it's going to be fun. More anon.

Good news for owners of the Vic 20 computer. JEP Electronics of 4 Houseman Walk, Kidderminster, have produced a morse code reader which works very well. If you have a radio capable of receiving morse, then load up your Vic and listen to the world. If you have no Vic, then, never fear JEP Electronics do the same thing for the Spectrum and the ZX81.

I'm always pleased to hear of readers of the column who have decided to write their own software and make a good job of it as well. Jim Warner G6LIR is one such person and he has produced a fine morse code tutor program which is available for a fiver from Jim at 39 Craddock Road, Clarendon

Park, Leicester, LE2 1TD. Jim has also written a database type program called *Call-sign Directory*. Details from Jim at the above address. Another reader, Mike Wooding G61QM of 3 Perkins Grove, Rugby, Warwicks, BV21 4HU writes in with news of a program for the ZX81 which turns the computer into an eight column by five rows character generator for amateur television. Mike says he will send the program free to anyone who sends him either ten blank cassettes or a roll of ZX printer paper. Obviously there is still a place for barter in a high-tech world.

I am in the process of compiling a complete list of radio and electronics software available for any computer, soon to be published in *Microradios* so if anyone has any software they would like to see included, then please let me know.

Finally, a couple of quickies. Mark Purcell of Bletchley, Milton Keynes asks if digital infor-

mation can be sent over Citizens Band. The simple answer is no, not legally. The CB allocation is licensed for voice only. You do not need a license to receive digital, RTTY or morse transmissions on any band.

If you want to transmit these signals then you can do so on the amateur bands which requires a licence from the Department of Trade and Industry. S Woodbury of Bromsgrove wants a Dragon Basic-code Program. Contact Grosvenor Software, 22 Grosvenor Road, Sussex BN25 2BS.

Ray Berry BW055N

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, *Microradio*, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Scrap Yard

on Vic20

Scrap Yard was written for the unexpanded Vic20.

The game requires skill and judgement, rather than pure fire-power.

You control the jib of a crane in a scrap

yard, picking up and lowering scrap into a number of different piles.

It's not as easy as it looks. Because the program has been structured in short stages, the program runs fast

```

1 REM *****
2 REM **
3 REM * SCRAP YARD *
4 REM *
5 REM * * BY * *
6 REM *
7 REM * S.VERYARD *
8 REM **
9 REM *****
10 REM
20 READ B:IF B>256 THEN 200
30 POKE B: B=A+1: C=C+B: GOTO 20
100 DATA 25,20,127,42,42,42,42,28
101 DATA 255,129,129,141,129,255,129,129
102 DATA 25,34,65,255,255,255,255,255
103 DATA 62,63,126,254,255,119,6,6
104 DATA 255,129,255,129,255,129,255,129
105 DATA 31,63,118,246,246,118,63,31
106 DATA 255,255,0,0,0,255,255
107 DATA 60,36,231,129,129,231,36,60,999
200 IF C<352 THEN PRINT "NEEDY DATA ERROR":END
210 POKE 36879,25:POKE 36869,255
215 POKE 36865,160
220 PRINT CHR$(14):"SCRAP YARD"
225 PRINT:PRINT
230 PRINT "YOU HAVE CONTROL OF A CRANE:"
235 PRINT "WORKING IN THE YARD,ONCE YOU HAVE
    PRESSED THE:"
240 PRINT "SPACE BAR,THE CRANE WILL START."
245 PRINT "WHEN YOU ARE OVER JUNK,YOU MUST PRESS THE
    BAR AGAIN TO LOWER".
250 PRINT "THE JIB",ONCE COLLECTED THE CRANE WILL
    RETRACK.IT'S PATH":

```

```

255 PRINT".THUS LEAVING YOU THE FINAL JOB OF
    DROPPING THE CARGO IN IT'S CORRECT PILE.:"
260 PRINT "*****"
265 PRINT "*****"
270 PRINT "*****"
275 PRINT "*****"
280 PRINT "*****PRESS A KEY"
282 FOR T=160 TO 384 STEP 1
284 POKE 36865,T:FOR I=1 TO 20:NEXT I,T
290 GET A:IF A=" " THEN 290
300 POKE 36869,240
305 PRINT "NOW LOAD MAIN PROGRAM."
5 HC=150:W=50
10 POKE 36869,255
20 POKE 36879,25
30 POKE 36878,15
40 T=7744:I=7766:S=255
50 PRINT "*****"
60 FOR Z=1 TO 19
70 PRINT "I":NEXT
80 PRINT "*****"
85 PRINT "*****SCORE*****"
90 FOR Z=1 TO 2:POKE 7718+22*Z,160:NEXT
100 FOR V=8136+2 TO 4
105 FOR Z=1 TO 16
106 X=INT(RND(1)*15)+1
107 Y=INT(RND(1)*16)+5
108 IF PEEK(7680+22*Y+X)<160 THEN 106
109 POKE 7680+22*Y+X,INT(RND(1)*4)+1
110 POKE 36840+22*Y+X,2
111 NEXT
120 IF C<1 THEN GOTO S500
125 POKE 36879,28

```

Baud Walk



Hooking up

Hope you read last week's introductory article about hooking your micro up to the telephone network. *Baud Walk* hopes to keep you in touch with developments in hardware, software and services.

News first. And it's good. It seems BT may be offering a new service next year which will allow micros to get hooked up and use the telephone network at a cheaper rate than normal telephone use.

Apparently the system — BitStream — will be on trial at 300/300 baud rate (the bits per second your micro sends and receives data with the appropriate modem). It could open the door to far more neighbourhood bulletin boards if the

telephone costs really do drop as they should.

At the moment I'm eagerly awaiting a modem from Concorde to check-out Compunet, Commodore's rival service to Micronet 800 which still appears to be on for a September launch.

Some more hardware news. A teletext adaptor has just been released for the Spectrum, and the BBC may well support it with educational telesoftware down-loading. The black box costs £143. Full details from OEL Ltd on 0768 66748. The trouble with teletext is you can't talk back to it. The bonus, is of course, it's all free, and you can save or print-out pages.

Also on the Spectrum front, you can now rent a modem together with viewdata and user to user communications software. Full details from Prism Microproducts on 01-278 3143. The modem normally costs £99 but can be rented together with a subscription to Prestel Microcomputing for £11 a month.

I dialed onto Prestel and

began looking for people to make contact with. First group to cross my path were the Midnight Micronetters. They are a special interest group (known as SIG) which you often find within databases. I left them a message arranging an on-line rendezvous at 11.30pm — bulletin freaks generally let their micros do the walking late at night and weekends. I stayed up late, but no message in reply.

Not to be deterred, I left another message on a Time-frame bulletin area — again within Prestel — telling them all about this Popular-article and inviting comments from users. They replied some hours later asking me to send the message again — it had fallen foul of data corruption and got garbled (in common parlance the telephone line crackled as I was transmitting the message). I did have some successes though — I saw advice for an Apple club. I Mailboxed for more details got a reply within half an hour telling me about the club's activities.

At about this point I started to get concerned about the telephone bill, but was relieved to see that session had only cost me around 25p for just over half-an-hour. That is the value of a public network — the ability to dial remote databases on a local code number. Bulletin boards can sometimes be more fun but it's often at STD rates.

Reports on bulletin boards will be coming when I get delivery of that 300/300 modem. So watch out for them in the following weeks. Also coming will be more news and advice about databases, hardware and software, hacking, junk mail, MUD...

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, *Baud Walk Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 019993727.


```

130 POKE36876,255
140 FORZ=1TOW:NEXT
150 POKE36876,0
160 GET#
170 IF#=" "RNDM<-40R=-19THEN200
180 POKE1+M,160
190 M=M-1:R=R+1:GOTO120
200 M=M+2:D=D+1:S=S-1
230 GOSUB500
240 IFD=17THENGOSUB900:GOTO1100
250 IFPEEK(I+M+22)<160THEN540
260 POKE36874,S
265 POKE36879,29
270 FORZ=1TOW:NEXT
280 POKE36874,0:GOTO200
500 POKE1+M,7:POKE36464+M,0
510 POKE1+M,0:POKE36466+M,0

530 RETURN
540 B=PEEK(I+M+22)
550 FORZ=0TOD
555 POKE36879,28
560 POKE1+M,0
570 POKE36876,INT(RND(1)*128)+128
580 POKE1+M+22,B
590 POKE36466+M+22,2
600 FORJ=1TOW:NEXTJ
610 POKE36876,0
620 POKE1+M+22,160
630 M=M-22:NEXT
640 FORZ=1TOR+1
650 POKE1+M,0
660 POKE1+M+22,B
670 POKE36466+M+22,2
680 GET#:"IF#=" "RNDM<-26THEN760
690 POKE36876,220
695 POKE36879,30
700 FORJ=1TOW:NEXTJ
710 POKE36876,0
720 POKE1+M,160
730 POKE1+M+22,160

740 M=M+1
750 NEXT
760 IFM<0<-21THENGOSUB900:GOTO1100
770 M=M+22:FORZ=1TOD
780 IFPEEK(I+M+22)=BTHEN960
790 POKE1+M,B
800 POKE36466+M,2
810 POKE36877,S
815 POKE36879,31
820 FORJ=1TOW:NEXT
825 POKE36879,25
830 POKE36877,0
840 POKE1+M,160
850 M=M+22:S=S-1:NEXT
860 POKE1+M,B
870 POKE36466+M,2
880 PRINT"#####
885 S=255:R=0:M=0:D=0:W=M-2:P=P+1:
IFM<0THENW=0
890 IFP<16THEN120
895 GOSUB900:R=0:M=0:D=0:P=0:
G=0:GOTO10
900 FORZ=1TOR
910 P=PEEK(8114-U+Z)
930 IFP=160THENGOSUB950:U=0:
NEXTZ:RETURN
940 U=U+22:GOTO910
950 IFU=0THENRETURN
960 FORO=(U-22)TORSTEP-22
970 POKE8114-U+Z,160
980 FORV=8136+ZTOR8141
990 POKEV,(S-Z)
1000 POKEV+30720,2
1010 FORC=1TOR
1020 POKE36876,INT(RND(1)
*128+128):NEXTC
1030 POKE36879,25+INT(RND(1)*7)
1040 POKE36875,0
1050 POKEV,160:NEXTV
1060 POKE36879,25
1070 SC=SC+10*Z

1080 PRINT"SCORE"SC" HI"HC:NEXT
1090 RETURN
1100 I=15:FORZ=38TOR153
1110 POKE36865,I
1120 POKE36878,I:POKE36877,255
1130 I=I-13:NEXTT
1135 POKE36869,240
1140 PRINT"GOOD DEAR!!":PRINT
"MYOUR JUDGEMENT FAILED!"
1150 PRINT",AFTER YOU HAD MANAGED
MTO SCORE"SC"POINTS"
1160 PRINT"M ON MATHS
SCRAP-YARD!!"
1170 IFSC<HCTHENPRINT"XXHOWEVER
YOU DID BEAT MTHE OLD HI SCORE"
1174 IFSC<HCTHENPRINT"XBY"SC-HC","
:HC=SC
1180 POKE36865,T
1190 FORZ=153TOR38STEP-1
1200 POKE36865,T
1210 FORI=1TOR38:NEXTI,T
1215 POKE36877,0
1220 PRINT"XXXXXXXXXXXXXXXXX
ANOTHER GO?<Y/N"
1230 GET#:"IF#="N"THENPRINT
"OK!!":END
1240 IF#="Y"THEN1260
1250 POKE36879,25+INT
(RND(1)*7):GOTO1230
1260 SC=0:P=0:M=0:D=0:R=0
:G=0:W=50:GOTO10

```

Scrap Yard
by S Veryard

Arcade Avenue



First stage

Time to look at Spectrum games, hints and tips that have been sent in. Owners of other micros seem much less willing to reveal their secrets — why not tell us all about *Blogger*, *Ugh!* and the like?

First comes a letter from P Cash of Weybridge who writes concerning *Zoom* from Imagine. "Getting through the first stage is much easier if, rather than moving your signs all over the place, you line up with the clouds on the level where the lowest planes fly in. You will find that the vast majority of the enemy, as well as the Exotron missiles, can be hit by moving just left and right. Planes that

come in above can be shot as they fly down to attack the refugees. On the second screen position the sights at the horizon. This way you can collect high scores without damage until later levels where two enemy types attack at once."

On to another flight game — Alan Simms of Crewes says that the safe way to score points in *TLL* by Vortex is to "use the plane's shadow to find a flying circle that passes you over the target and avoids obstacles. You then lower the plane's height and score the points. On later screens the targets become more confined and you must use the wraparound effect of the map to find a safe approach line. To land for refueling fly the plane from right to left using the altimeter to bring you down to almost ground level after passing the tree covered island. When the runway appears gently lower the plane the final distance. It will still travel some distance on the ground which is why you need to be already low."

With regard to *Crystal's Halls of the Things*, he says: "I was very upset to collect all seven rings and score 1287 points only to be polished off on the lower screen which requires completely different tactics. I advise people to practise this level by pressing 2 and Space. Once in you cannot leave so run quickly from left to right to out distance attack, pressing fire and keep to clear boulders and bottles in your path. Check status frequently. After 30 seconds or so — if you live — you will have cleared the lower area and can work your way up to find the key. Fire arrows up the left- and right-hand walls because things creep down here. You will always be hit, so if you have high wounds when you enter you really have no chance."

In *Artic's Mr Wong* you get maximum points for starching the chasing monster rather than collecting all the clothes. I suggest you stay on the lowest level, which has only two pursuers, until you have collected enough points to get some

extra lives.

"Finally the most maddening game I have ever played is *Tribble Trouble* from Software Projects. To complete the first level the best tip is to keep returning the tribbles to the ship as soon as they emerge. When the game begins, move right immediately to catch the first tribble. For anyone stuck on level three, don't worry — it is much harder than the later two. Head butt the spheroid to the right and send the tribble to the left before laying the tin-tack. If the ball misses the tack run quickly back to the left to protect the tribble. Practice and patience will get you through."

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame) then write to: Tony Kendle, Arcade Avenue, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Tony Bridge's Adventure Corner



Monsterbash

Those adventurers lucky enough to own a Commodore 64 are thrice-blessed — not only are they able to mess about with one of the best machines on the market today, with a wealth of fantastic software from both sides of the Atlantic, but they are also able to play a couple of great adventures (among many others of course) — *Zork I*, and *Heroes of Karn*.

Zork I, the first part of the great trilogy, must not be missed. Until now it has been horrendously expensive at £35 or so, but now it has been re-priced at just £11.99, albeit on disc only (as are all the other Infocom titles). If you're at all interested in adventures, buy it, buy it...

The second adventure is home-grown, and I include it here because many people have written to me about it over the months. The program is *Heroes of Karn*, from Interceptor and I am told that it is "atmospheric and graphically rewarding" — this remark from Tom, of Richmond, North Yorks (Tom offers his help on 0748-4090).

The game's object is to find the four eponymous heroes. This is achieved in various ways. Use the list of words at the foot of this week's *Corner* to see how to rescue each hero:

BEREN : 12-6-13.
 ISTAR : 40-15-18-4-23.
 HADLIR : 28-10-42-36-20-29-8.
 KHADIM : 28-34-42-9-1-24-38-16-30.

Now for some general tips:

To get past the Lizard : 26-21-7.
 To get past the Guard : 37-13-2.
 The Pirate? : 31-11-13-14-5-35-33-10-11-13-14-19.

To get past the Spider : 41-31-43-22.
 To get past the Bear : 37-13-45.

The Ring of Darkness, from Winterset for was, for many months, only available for the Dragon, but has now been implemented on the Spectrum and other micros, thus gaining a whole new audience. I haven't these new versions for myself, yet but, judging from your letters, it is very similar to a favourite of mine from America, the *Ultima* series by Lord British. Both consist of a graphic, scrolling map around which the player moves. The US version is a little more ambitious, allowing the player to define and save many characters to disc, and then use up to four in a party.

The Ring has been discussed many times in various places, so I won't go into detail here — but see John Scriven's mini-review in the *Corner* way back in July last year (Vol 2 No 27: he liked it!). Briefly, the adventurer has to equip him/herself with weapons and armour and then go forth to collect experience, Hit Points, gold and all the usual stuff, on the way to finding four rings, and then, *The Ring* itself.

Neil Scrimgeour, writing to me in the *Corner* of March 22, was struggling a bit with the program, finding that he couldn't gain enough gold and experience to progress. Tony Treadwell has written to assure him that all is well. In fact, says Tony, to amass experience and so on, the intrepid traveller has to venture into the lower levels (though not too far, for your character will not be able to withstand the attacks of some of the monsters further down) until sufficient treasure and combat experience have been amassed. As soon as your Hit Points get a bit low, move upward very quickly. Upon reaching the exit, you will gain extra Hit Points and also be able to afford better weapons and armour.

Geoff Haydock, on the other hand, reckons that it is better to first of all enter one of the towns and find the dungeon where the Princess is kept. If the jester says he has the key, then kill him and grab it, quickly getting to the dungeon's entrance, thus freeing the Princess. Although, says Geoff, you will now be killed, you'll find, upon reincarnation, that you now have lots of points and can buy anything you want — then you can have a real monster-bash!

D G Spiller had much the same to say

about this adventure, going into more detail about the endgame. In common with the others, the buying routine was found to be extremely slow and repetitive, saying that it would be better to be asked by the program "How many of this item?", rather than having to go through the whole selection routine for each spell or article. When you want 50 of one kind of spell, you will need a strong typing finger.

D Spiller finishes with a list of adventures for the Dragon that he has completed.

"Ring of Darkness: 9/10 Pettigrew's Diary (Shards Software): 8/10 — very good, but, as it is in Basic, too much of a temptation to cheat! Madness and Minatour (Dragon Data): 7/10 — a complex but very frustrating game, mainly as progress cannot be 'saved'. I still haven't scored more than 55 out of a possible 290. Too much dependence on chance — recommended for those with a high tolerance level. Quest (Dragon Data): 3/10 (and I'm being generous) — very boring and almost totally random (value for money 1/10). Transylvanian Tower (Richard Shepherd): 5/10 — not too bad, but no skill involved. More suited, perhaps, to the 12-15 year-old. Super Spy (Richard Shepherd again): only took 2 hours to solve, but I did like it enough to complete it, unlike Transylvanian Tower — so 5.5/10. Pimania (Automata): 6/10 — imaginative concept, and the prize probably just makes it worth the price. I think I could solve it, but random elements stand in the way, though this is acceptable considering the prize.

"I really feel left out, not being able to have a bash at *The Hobbit* or *Valhalla* — is there any chance of them being converted to the Dragon?

A couple of weeks ago, I categorically stated that there was absolutely no chance that *Lord of the Rings* would ever make an appearance on a home micro — in the same issue the news story broke that Melbourne House had finally got the rights to the book! So, I hesitate to say that the two programs will not be converted. Even so, considering the state of the Dragon at the moment, I would think it unlikely.

Code words: 1 Golden; 2 Bag; 3a Flag; 4 Crystal; 5 Start; 6 The; 7 Surrounding; 8 Anything; 9 Play; 10 Istar; 11 Kill; 12 Kiss; 13 Him; 14 Near; 15 Flute; 16 Open; 17 Wants; 18 In; 19 End; 20 Vampire; 21 Of; 22 Music; 23 Room; 24 Lyre; 25 He; 26 Think; 27 Pirate; 28 Tell; 29 With; 30 Chest; 31 Don't; 32 Wave; 33 Let; 34 Hadlir; 35 But; 36 Attack; 37 Give; 38 And; 39 Wand; 40 Play; 41 They; 42 To; 43 Like; 44 At; and 45 Honey.

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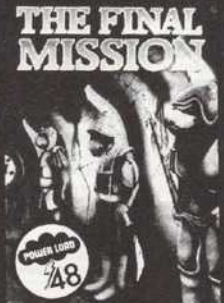
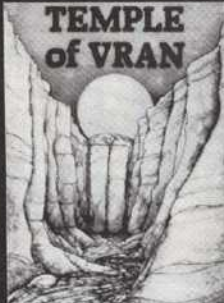
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No Software

K Kauter of Basildon, Essex, writes:

Q At Christmas I acquired a computer. The main difficulty I find with it is the software (or lack of it). I have enquired in a number of shops, which stock Vic 20, Electron etc software, but with no sign or anything for the Aquarius. Surely with all the publicity that was given this computer at Christmas time there should be by now more software available.

I would be grateful for any advice you can give me.

A The Aquarius has suffered from the cut-throat competition for space on the software shelves. As it did not make a major impact in the market it lost out in the software stakes. Also, the decision by Mattel to drop the machine did nothing for its popularity with retailers or software houses.

Do not lose heart however, Radofin Electronics who manufacture the Aquarius and are committed to its continued development. My advice is to write to them asking for the address of your nearest stockist of Aquarius computers as they will also stock the software. Radofin's address is: Radofin Electronics (UK) Ltd, Hyde House, London NW9 6LG.

Fall foul

W M Dunn of Leeds writes:

Q I would be grateful if you could supply information on the subject of copy-

right, which I find both baffling and controversial.

My employer allows us the use of a social club for computing activities, and we would wish neither individually, nor collectively to compromise him by unwittingly falling foul on problems connected with copyright.

My enquiry falls into 2 categories: 1) Printed articles which are published in computer magazines. Are we in breach of copyright by circulating copies of these magazines? 2) Cassettes. Is the copying (not for personal gain, but for general interest) again placing us in breach of copyright?

A I appreciate your problem Mr Dunn, I'll try and answer as best I can.

It all depends on scale. There is nothing wrong with swapping a magazine with a couple of friends. On the other hand any publisher is going to take a dim view if you start photocopying whole magazines and circulating them to fifty people.

You have to distinguish between what might be considered reasonable or not.

What you must not do is to reproduce articles contained in the magazines for submission to, or inclusion in, any other publication.

Your second question concerned the copying of software tapes, and is much easier to answer. You are in breach of copyright if you copy software and either give or sell it to another person. Whilst I sympathise with you, as the law stands, you would be breaking the law if you either copied tapes yourself, or accepted copied tapes from someone else.

You might be interested to know that anyone who uses a video recorder to record a TV programme, to be watched at a later date, is technically in breach of copyright. Also, recording radio programs, or taping someone else's record collection is a breach of copyright.

It is largely due to these commonplace breaches in the regulations that the copyright laws in this country are held in so little regard.

Stringing

Philip D'Abell of Hucknall, Notts writes:

Q I am having problems stringing together some *Load* statements on my Spectrum. Firstly I want to load a character set which is machine-code, so it is a *Load* "Code" instruction. Secondly I want to load a picture, so it's *Load* "Screen". Lastly I want to load the main Basic program, which requires *Load* ". How can I string these together so that the user need only type in one *Load* statement?

A In order to achieve the desired effect you will need another program. This will be loaded first and its function will be to load the other three parts of your program. The statements below show an example of such a 'loader' program.

```
10 CLEAR 50000 (clears sufficient memory for the machine code)
20 LOAD " " (loads machine-code)
30 LOAD " " (loads the picture)
40 LOAD " " (loads the main program)
```

Two final points: why not load the picture before the machine code and make the main Basic program auto-run by saving using the *Line* option as described in the Spectrum manual.

Amstrad

Lee Madden of Leeds, West Yorkshire writes:

Q I am considering buying an Amstrad CPC 64 personal computer, but before I do I'd like to ask you the following questions.

I am buying the model with the cheaper, green monitor.

Will this in any way, other than in the colour sense, impair its capabilities or restrict the software I can use?

Is there a software company that writes software for this computer, and of what standard is the software?

A The use of the green monitor should not in any way affect the machine's capabilities or restrict your choice of software.

A number of the leading software companies (both games and business) are working on programs for the Amstrad.

The standard of software that I have seen so far is very good, and compares very favourably with that of the existing top sellers — Sinclair, Commodore and Acorn.

Smart move

A Van from Oxford writes:

Q I have just bought a Smith Corona TPI printer for my Commodore 64. It works well with *Easyscript*, but when I use it with *Practical* (disc version), I just can't get it to print. I rang the hotline of Dataplus where I bought the printer and I was told they had not even heard of *Practical*, let alone were able to give me any advice. Please can you help?

A Ram Electronics market a CBM 64 Centronics Printer Interface which is compatible with your printer and the two software packages you mention. The interface takes the form of a 'smart cartridge' (their words not mine), which plugs into the user port. It costs £49.95, and is available from RAM at 106 Fleet Road, Fleet, Hants GU13 8PA.

A ribbon cable version is also available, but this requires a software tape to be used as well. This costs about £23.50 and is also available from RAM.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD

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MISSION IMPOSSIBLE for VIC-20 to swap for any other VIC cartridge Tel: Saddleworth 2518 Sat. Mornings only

SWAP ELECTRON software. All originals. Killer Gorilla, Cybertron Mission and Felix And The Fruit Monsters. Originals only please. Deka, 22, Baring Street, South Shields, Tyne & Wear. NE33 2DR Write Soon!

SWAP ZX PRINTER plus 8 rolls paper for Fuller master unit. First unit received accepted. Send to D. Scott, 260 Harden Place, Hawick, Roxburghshire, Scotland TD9 7BY.

SWAP CBM 64 and disc drives + cassette unit + lots of s/w. Excellent condition. For BBC model B with s/w. Or sell for £400. Tel: 01-736 3898. Byron.

WANTED BC BASIC on ROM cartridge or cassette, might consider Simons Basic Tel: 051 733 0090. after 4pm.

SWAP EASI SCRIPT word processor package for CBM64 — For Jet Speed 64. 3 months old. Never used. Boxed with manuals. Tel: (Notts) 208108. mr McKenzie.

WANTED ZX printer for original Spectrum software Penetrator Arcadia Devil Of The Deep Cruising Starship Enterprise Gulpman Flight Simulation or will pay cash. West Yorkshire area.

SWAP 48K SPECTRUM (under guarantee) with leads, manuals, amplifier, tons of mags, books, etc. for any Atari computer (must have 48K RAM or cassette). Tel: Bham 021 357 9452 after 5pm.

SHARP MZ-80K, 48K memory, with built-in b/w monitor and cassette deck; + software and manuals. Ideal for business and home use, only £180. Tel: Thame 594919.

SWEET TALKER speech module for ZX Spectrum. As new £200 one for quick sale. Tel: 0388 832112.

Dragons for sale

DRAGON 32K for sale. Lots of software and books. Including 9 Rainbow mags. £75 ono. Tel: Upminster (04022) 21639, ask for John, evenings..

DRAGON 32 for sale. Boxed with joystick, books, magazines and many games, worth £350. Sell £180 ono. Tel: 0846 682546 after 6pm.

DRAGON for sale with tool kit cartridge and over £200 worth of software. Lots of books and mags. Three joysticks, cassette recorder, all leads. As new for £140. Tel: Basildon 414392.

DRAGON 32 NEE PC8023 printer typewriter. 500 sheets listing paper, cassette recorder, two joysticks, the king. Offers under £350. Will split. Tel: Mark Almondsbury 0454 612580, Bristol area, after 6pm.

DRAGON32 software for sale, Donkey King, Frogger, Cave Fighter and Orgrunner. All new and in excellent condition. All for £30. Tel: 01-363 0862.

DRAGON 32. Boxed as new. 3 joysticks, lightpen + magazines + 19 games and utilities £160. Tandy GCP-115 colour printer/plotter + Dragon lead. Cost £167, sell for £105. Sell together for £255. Tel: 01-360 3443.

MODEM for Dragon 32 — Maplin modem complete with RS232 interface and program tape. As new, complete and ready to use £80 ono. Tel: 01-422 0941 eve/w.ends.

DRAGON 32. Boxed, 2 cassette recorders, 3 joysticks (Quickshot), dust cover. Many Dragoner mags, year subs to Dragworld, s/w worth over £140. Storage unit £200 ono. Tel: 01-858 4672.

DRAGON software for sale £5 each. Horace, Kriegspiel, Jungle, Painter, Android, DGTZ, Madness, Minature, Dragon Mountain. Special selection, 2 or swap any 2 for any cartridge except Ghost Attack. Tel: (Hull) 0482 502389.

DRAGON 32 s/w for sale. Please ring after 7pm. All originals. Tel: 01-730 1688.

DRAGON disk drive, 10, 20 disks, boxed as new £200 ono. Also lots of cheap original s/w. Tel: John 0282 57057.

DRAGON 32, 15 months old, 2 Dragon data joysticks, light pen, over £280 of s/w. Sell for £250. Tel: 01-904 4185.

DRAGON 32 games, books, mags, joystick etc. Swap for Electron or sell £200 ono. Tel: 653 2388.

DRAGON s/w, 15 titles, inc. Adventurer £114 worth. Sell for £75 ono. Tel: 0942 672058.

DRAGON 32 + leads + books, boxed, £85. Tel: 061 652 0905 after 6pm.

DRAGON64 with single disk drive, joysticks, speech + sound extension module + s/w + mags £450. Tel: Weston-Super-Mare (0934) 814314, Nigel.

DRAGON 32 + 3 joysticks. Over £300 worth of s/w (originals) inc Assembly program books, mags and n assembler + tape recorder £170 ono. Tel: Newport 400377 anytime..

DRAGON 32 + £150 s/w inc Cricket, Buzzard Boy £160. Tel: 024-541 4508.

DRAGON 32 joysticks (3), voice synthesiser, Hi-res, Dasm cartridges, 1/ recorder, light pen, dustcover, loads of s/w, mags, books. Total value £450. Yours for £195. Tel: Craig, Wickford 65351 after 6pm.

DRAGON 32, boxed, as new, cassette recorder, 2 joysticks, dust cover. 44 latest games cassettes. All Dragon user magazines, teaching books. All mint condition, value £700. Quick sale £160. Tel: Hornchurch 44866.

DRAGON + 3 joysticks, light pen, magazines, dust cover and software. Less than one year old £160. Tandy GCP-115, colour, graphics, printer + Dragon lead £100. Tel: 01-360 3443.

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DRAGON 32 + 3 joysticks. Over £300 worth of s/w (originals) inc Assembly program books, mags and n assembler + tape recorder £170 ono. Tel: Newport 400377 anytime..

Flight Simulators, etc. I also wish to buy secondhand software. Tel for details: Bob Hill, Bognor Regis (0243) 826012.

FOR SALE. Dragon 32 + joysticks, Dash, Derron, Parallel printer cable, some software and many books. Mint condition £100. Tel: 0884 256119.

DRAGON disk drive for sale plus 20 disks. Boxed as new £200. Also some very cheap original Dragon software.

Tel: John, 0282 57057 (Burnley) evenings..

DRAGON software sprint basic compiler £8. Dasm/Demon assembler monitor cartridge £15. Rainbow writer screen enhancer £10. Tel: John, 061-792 1122 after 7pm.

DRAGON 32 joysticks, 3 books, magazines, 15 software titles including The King, Hungry Horace, Ugh, Basic tutorial tape, Katerpillar Attack, Mined Out. Excellent condition, still have box £125. Tel: Derby 513579.

DRAGON 32 software costs £170 (including Churchill Egg, Devils Assault, Frogger, etc) for £80 ono. Or will split for half price. Tel: Ipswich (0473) 310582.

DRAGON 32, brand new, unwanted gift. All leads, manuals and game cassette. Best offer over £100 secures.

Swap BBC programs, 1/K football and BBC soft Canyon. Tel: Corsham (0249) 715380 evenings.

DRAGON 32 under guarantee with new joysticks £50 of software, books, mags, all leads. Boxed with manual. Tel: 01-928 0857 after 4pm. Ask for Alex Price ????

INSTANT arcade games for the Dragon 32. A book of basic programs, hints and ideas for writing your own programs, excellent condition, only £3. Tel: 585351 after 5pm.

DRAGON 32. Boxed, as new. All leads, plus manual, three months old. Genuine reason for sale £110 ono. Tel: Abergevenny (0873) 68225. Contact Miss H. Manley.

DRAGON s/w, 140 titles, all originals, for sale. Tel: Alistair, 0236 21918 between 7-8pm.

DRAGON 32, 80 colour printer, s/w, joystick. New £140 or swap issue III Spectrum 48K + s/w. Sell every issue of your complete mags. Offers. Tel: (0920) 68264.

ZX81s for sale

SINCLAIR ZX81 personal computer. Ideal for beginner all leads and manuals included. Very good condition. Only £25. Tel: 01-319 1572 after 5pm.

16K ZX81 with Maplin keyboard, books, £40 worth of software including high resolution Invaders, Flight Simulation, 3D Defender, Q's, Scramble, Galaxians, Espionage Island. All original copies £65 ono. Tel: Grimsby (0472) 827828.

ZX81 16K Memotech keyboard. All leads, mags and hundreds of programs on paper. £65 ono. Tel: Bradford (0274) 611579.

ZX81 16K plus keyboard (mounted) £200. Games £80 ono. Tel: Basildon (0268) 3521. One spare Ram pack two books.

ZX81 + Memotech 16K memory pack, 7 cassettes + 2 book + manual £55. Boxed as new. Tel: 061-370 0113, Steve..

ZX81 16K file sixty keyboards, 15 arcade style games, manual + games, books, mags. Ideal first time computer. Offers considered. Tel: Ramsbottom 4314.

ZX81 GAMES 1K + 16K, £2 each. All originals. Tel: 01-937 5764 after 4pm.

ZX81 16K plus four full FO42 keyboard, manual, leads, larger amount of software including Compiler, Chess, Invaders, Payroll etc. £80 ono. Tel: 041-884 2153. Ask for Derek..

ZX81 16K RAM with games and books only 6 months old. VGC £45 or swap for ZX printer.. Tel: Steve on Bridport (0308) 23602 after 6pm.

ZX81 with 16K. All leads and manual. Book, tapes and many listings. Sell for £50. Tel: Manchester 061-766 8062.

ZX81 FD42. Full size typewriter keyboard £15 ono. 16K Rampack £8 ono. 3D Monster Maze and electronic projects. Book free with first item sold. Tel: 04215 61883 after 5pm.

ZX81 s/w, inc Flight Simulator, Super Glogger, Super programs, Ocean, Scrabble, Space Laser. All £3.50 or less. Or sell the lot £6. Tel: 01-304 1023.

Acorns for sale

BBC MODEL B 1.2 OS, books + games and offers. Tel: Tamworth 53006. Steve.

BBC MODEL B — 1.2 O/S 32k with cassette unit + leads etc. Ass Programs (25) v.g.c. £320 ono.

BBC MICRO 32K O/S 1.2 s/w £350 ono. Tel: Chorley 69722 Peter.

BBC MICRO + DFS 40/80 switchboard disc drive, s/w, joystick, books, sell £600. Tel: Horton-Lee-Spring 849342.

ACORN ELECTRON tape recorder — 27 s/w games — sell for £260. Or swap for CBM 64 + C2N. Harlow 27846. Paul

BBC SOFTWARE £4 each, Eagle Empire, Pedro, Cylon Attack, Transistors Revenge, Android Attack. All originals reason for sale — sold my Beeb Tel: Andy on 0272 516335 8am till 10.30pm.

BBC COMPATIBLE disc drive 100K with utility disc and manual 3 mths old £120.00 ono. 48K Spectrum with over £60 worth books and software. Richard

Oxford 249891 ext 6019 or 251884.

BBC MICRO software and books. Overdrive, Battletank, Cylon Attack and

COMPUTER SWAP

COMPUTER SWAP

Please write your copy in capital letters on the lines below.

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.

Warning: It is illegal to advertise pirated software.

Name.....

Address.....

Telephone.....

Canyon Games. £4 each. Books — Basic Programming — Neil and Pat Cryer £4. Games for BBC Micro £1.50 Telephone (0795) 874022.

Ataris for sale

LOOK, ATARI 600XL with selection of cartridges including Popeye, Donkey Kong, Miner, 2049er, QIX, Centipede, Gorf plus joystick and manuals. Quick sale, only £130. Tel: 0903 42013.

ATARI V.C.S. for sale, 1 year old. Also five cartridges. Popeye, Amidar, Berserk, Combat and Star Raiders with touch pads. £90 ono. Tel: Phillip on 01-764 2469.

ATARI 400 without basic plus leader £39. Tel: Lloyd, 01-274 90910 after 8.30pm.

ATARI VCS, 6 cartridges including StarMaster, Indy 500 and Pacman. System housed in wooden console, with cartridge and literature space. Also driving controller. Excellent condition, only £85. Tel: 01-319 1572 after 5pm.

ATARI 800XL computer. Only 3 months old. £200. Software also or cartridge cassette and disk 16K to 48K. Tel: for details, Burnwood 72055.

ATARI VCS with joysticks, paddles, etc. 5 games inc Asteroids, Berserk. Well cared for £55 ono. Tel: 01-9600094.

ATARI 600XL. Boxed and unused, guaranteed till January 4. Games, Lone Raider etc. £125. Tel: Steve, Wrexham 753238.

For sale

VIDEO GENIE with 48K ram, assembler/dissassembler games + many books £85. Tel: Kings Langley 62678.

VIDEO GENIE 16k built in recorder, s/w inc games and adventures, manuals for beginners, advanced programming, graphics, games + servicing. £125 ono. Tel: 0438 720521.

A NEW BRAIN AD 32k complete with Axiom serial printer. 80-40-20 column s/w selectable, 6 spare rolls of paper, all leads manual, some s/w. £275 ono. Tel: 0438 720521.

ZX PRINTER. Very good condition. £25 ono. Games Designer Oric £10.00. Tel: 0474 61888. Paul.

FOR SALE Sharp PC 1245 hand held + C3 125 cassette. Printer interface. Complete as new £100. Tel: 01 521 1058.

LYNX MASTER Mind complete with colours + number code, 8 levels. Play the computer or other player or set your own codes for someone else — sound on/off, best master mind out. £8.00. Tel: 205 6740.

ORIC 1, 16K, black and white TV cassette recorder £40 of s/w, £45 of books and issues of Oric Owner mags. £130.00. Tel: 01-649 5354.

AGF PROGRAMMABLE joystick interface + Quickshot II joystick. Both under guarantee for only £25.00. Simon Barry, High Wycombe 20282.

LYNX 48K computer £160 ono. Tel: (0927) 702950.

48K Oric-1 plus all leads, manual etc, plus Forth with manual, plus Oric book, and Oric Assembler, with games inc. Zargon's Revenge. £75 and Tel: Andy 0272-516335 8am till 10.30am.

LYNX 96K brand new with 9 programmes and Pye data recorder. Selling for £300 ono. 01-961 2254.

DK TRONICS keyboard for Spectrum. Easy to use and time saving. £30 ono. Telephone Redditch 61729.

BARGAIN BEEB disk drive! 400K, 5 1/4", including disk interface and KEN-DA DMFS kit. Complete with manual,

new, unused. Half-price, JUST £200! 01-788 8749.

Wanted

WANTED. Intellivision cartridges. To buy or swap for Spectrum program (2 per cartridge). A. Measure, 73 Foxborough Road, Bradley, Abingdon, Oxon OX14 3AE.

ANY ATARI computer. Tel: (0229) 31542.

WANTED. Electron s/w. Nicholas Hayrey. Tel: 021 742146.

WANTED. Any Amstrad s/w. Good price paid. Only original. Tel: 01-794 7079 evenings.

WANTED. Atari 800 48K basic cartridge + data recorder. Pay in the region of £150-£200. Tel: James, 0440 705266.

WANTED. Commodore 64 disk drive. Tel: 01-886 98078. Ask for Pas.

WANTED. Atari 400 48K. Tel: 0656 5463.

WANTED. Oregon disk drive. Tel: 0495 28919 (after 5pm).

SWOP BBC B, six months old plus tape recorder and joystick interface, over 140 games and utilities for Commodore 64 plus disk drive and software (any other extras considered).

WANTED. Good condition basic ZX80, ZX81. Will pay £8 for ZX80 or £10 for ZX81 or swap for six Spectrum originals which cost me £30. Tel: Steve on Coventry (0203) 418809.

WANTED. Original Acornsoft programs (tapes or disks), for BBC. Any other manufacturer's tapes, disks or ROMs also wanted. Tel: (05827) 69552.

NON WORKING computer wanted, any make except ZX81. Any condition, also printers memory etc. Cash waiting. What have you? Tel: Chris on Birmingham (021) 328 4474.

HARDWARE hackers. Exchange my Nascom two, 32K 19 inch rack system, keyboard P.S.K. untested but believed working, for ZX81 with Eprom programmer, speech synth, keyboards, printers etc. or cash. Tel: Preston 864599.

DRAGON 32 software wanted. Originals only. Will pay £2.50 per tape. Tel: Reading 475826 after 4pm.

SWAP Vic 20 starter pack + chess cartridge + software + handbook. As new for 48K Spectrum or sell for £85. Tel: Longridge 4570 (Preston).

ADVENTURE HELPLINE

Lords of Time on BBC B. 1)

What do you pay the barman with for the barrel of ale? 2) What use is the Bureau de change, Android and Grouit, and also how do you pick up the star in cog7 and get into the starship? 3) How do you get the coin off the compost heap in cog 1 in the garden, and how do you kill the lion and the gladiator in cog 8? 4) What use is the dragon in the copse cog 5, and how do you get past the snow tiger? Andrew Wigmore, 163 High St, Rainham, Gillingham, Kent.

Snowball on Spectrum.

Which buttons in which order do I press on the panel with the coloured buttons? Kevin Allen, 10 Addicott Rd, Weston-super-Mare.

Smugglers Cove on Spectrum.

With what item do I feed the hungry cat and where do I get this item? Kevin Allen, 10 Addicott Rd, Weston-super-Mare.

The Hobbit on Commodore

64. How do I get out of the goblin's dungeon? Anne Wiggins, 76 Donegore Drive, Antrim, N Ireland.

The Hobbit on Spectrum.

How do I get past the elves' magic door after passing the spider? C MacDonald, 135, Fells Rigg, Carmondean, Livingston.

Heroes of Khan on Commodore 64. I can't seem to get past the phoenix in the Hall of the phoenix or the giant spider in the treasury. Lisa Bingley, 49 Logan St, Market Harborough, Leics.

Colossal Adventure on

BBC B. How do you get the chain off the bear? Where is the vending machine? How can you take the lamp in the plover room? Jason Phillips, 242 Queenborough Rd, Halfway, Sheerness, Kent.

Invincible Island on Spec-

trum. How do I get off the island, having found the treasure and evaded the natives? Paul Taylor, 48 Glenarm Crescent, Brant Park, Lincoln.

The Count on Vic 20.

I've got the no-doze tablets but an unable to open the coffin before it disappears. Jane Reid, 54 Corbet Close, Hackbridge, Surrey.

Grave Robbers on Commo-

dore 64. I can't get beyond the lift room and on the way there my radio vanishes. Mrs Pat Porter, Church Lane Cottage, Bucklesham.

The Wizard and the Prince

on Atari 800. How can I get across the chasm to get to the cottage at the other side? Chris Heath, 4 Gateway Ave, Oswestry, Salop.

The Hobbit on Spectrum.

I always get stung by the spider under the waterfall. Anthony Roberts, 75 Tanycoed St, Penrhuiwceiber, Mountain Ash, Mid-Glamorgan.

Diary

Event	Venue	Dates	Admission	Organisers
Electron and BBC Micro User Show	UMIST Manchester	Aug 31-Sept 1 10.00am-6.00pm Sept 2 10.00am-4.00pm	£2.00 adults £1.00 children	Database Publications 68, Chester Road Hazel Grove, Stockport 061-458 8383
Games Day 84	Royal Horticultural Society's New Hall, Greycoat St London SW1	Sept 1 10.30am-6.00pm Sept 2 10.00am-5.00pm	£1.25	Games Workshop 27/29 Sunbeam Road, London NW11 01-985 3713
Hampshire Computer Fair	Guildhall Southampton	Sept 6 11.00am-9.00pm Sept 7 10.00am-5.00pm	Trade - free Public - £2.00	Testwood Exhibitions 0703 31557
Walthamsoft 84	Main Exhibition Hall Waltham Forest Technical College Forest Road, London E17	Sept 8th 10.00am-5.00pm	£1.00 adults	London Exhibitions and Promotions 38 Exeter Gdns, Ilford, Essex 01-554 8038
ZX Microfair	Alexandra Palace London N22	Sept 8	£1.00 adults 60p children	ZX Microfairs 71 Park Lane London N17 0HC 01-801 9172

FLICKER-FREE

Now that all the Spectrum arcade games have to have good-sized sprites there's a battle going on (for second place — Ultimate are still number 1) over who can have the biggest, flicker-free-est, best-designed and least showing of attribute conflict problems.

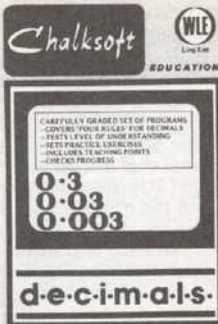
Micro-Gen's *Automania* must be a front runner. It features Wally Week who is not a period of time but an idiotic character *a la* Cuthbert, and also a beautifully animated 2 inch or so high sprite. Wally is a mechanic and he has to collect various bits of a car from a number of different screens and take them back to the workshop and fit them in place assembling a completed vehicle. There are ten cars to complete altogether.

So you collect things, dodge things, jump up to and across things to complete each car — you have a time limit and three lives. Remind you of anything? The program is subtitled *Manic Mechanic*.



Original no, but the graphics are pretty spectacular and the game is amusingly silly and good fun. If you are into the *Miner* school of game then (apart from the money) there's no reason not to go out and buy this one.

Program Automania
Price £6.95
Micro Spectrum
Supplier Mikro-Gen
44 The Broadway
Bracknell
Berks.



for VIC 20
with Software (10.00) and (10.00) and (10.00)

UNFUSSY

Educational programs for the Vic20 are fairly few and far between — which is strange considering the way in which the Vic starter pack is sold very much as being suitable for young kids and their parents learning about computers.

Decimals is one such educational program for the Vic. It requires 16K and it's also a conversion of a very well received program on the BBC.

The programme begins with a short test section so that the level of difficulty can be adjusted automatically. That done, the program can cover virtually every area of decimal teaching — multiplication and division, decimal point, etc. Graphics are clear and unfussy and there are revision sections and exercises.

Program Decimals
Price £9.25
Micro Vic 20
Supplier Chalksoft
37 Willowslea Road
Worcester
WR3 7QP

MORTAL REMAINS

Rapsallion is the latest release from Bug-Byte. It is a multi-screen cartoon-style arcade/adventure roughly in the style of *Alchemist* and *Atic Atac* but with many special features of its own.

The idea is that you have been captured by the wicked and evil Rapsallion and imprisoned in a dungeon whilst he takes possession of your castle. All is not lost. You have a

Pick of the week

STARRY-EYED

Star Seeker is an astronomy program that comes with the backing of no less an authority than the Planetarium itself. Pause for gasp. It has been designed for everyone from dabblers to (the blurb suggests) professionals.

Actually *Star Seeker* is essentially two programs, *Star Seeker* proper and *Solar System*. *Star Seeker* enables you to see the stars at any place and at any time. From this, using a cursor any star can be pinpointed and additional information about it discovered.

What this means, in practice, is that you can use this program to find out what you can see in the real world, ie, the sky above your head. This intrusion of reality into the world of computer software can only be a good thing, although what effect fresh air will have on sickly white computer owners I dread to think.

The second program, *Solar System*, gives you visual information on the planets and such

things as Haley's Comet. It can plot orbits, flight paths, etc, and using a similar cross-wire system to *Star Seeker*, can provide lots of background information on each heavenly body. The whole thing comes with an excellent explanatory manual and if you have even the slightest interest in astronomy then this is for you.



Program Star Seeker
Price £9.95
Micro BBC
Supplier Mirror Soft
Holborn Circus
London
EC1P 1DQ.

fairy godmother who casts a spell that turns you into a bird or a fly, and off you set to do battle and regain your premises.

There are three stages to game; in the first you are in the Wilderness looking for the key to the Magic Labyrinth — the Wilderness consists of a large number of totally bizarre rooms in which occasional useful objects are to be found — these feature such diverse paraphernalia as tennis players, high voltage generators, cats, trains, viaducts and furnaces all of which are contrived to bash, bump, zap, blast, squelch and batter you unless you are very careful indeed. Choosing your form, fly or bird, is part of the equation.

If you get killed you become a ghost — in this transient form you can do nothing but wander from room to room trying to find your mortal remains — this will let you start again. From the Wilderness you pass (assuming you have the right objects) to the Magic Labyrinth (find the Pixie with the magic eye) and eventually on to the

Castle where, by some amazingly complicated set of procedures, you may discover the magic wand with which to defeat Rapsallion himself.

Graphically the game is somewhat peculiar — some of the shapes are in your normal sprite hi-res, others are in a mode that, for want of another name you could call teletext, ie, they are constructed out of small blocks. Presumably this is done to save memory space, given the many rooms in the game. It looks a bit off but is, I suppose, not without its own charm.

Whatever else, *Rapsallion* is pretty inventive and will take ages to play. Fans of this kind of game should enjoy it very much.

And it might be the game to put Bug-Byte back into the top of the charts.

Program Rapsallion
Price £6.95
Micro Spectrum
Supplier Bug-Byte
Mulberry House
Canning Place
Liverpool L1 8JB

BENEVOLENCE

Mirrorsoft has, of late, concentrated on educational software despite the superb *Caesar the Cat*.

Its next arcade game is *Hi Bouncer* which features those irritating children's characters, the Mr Men, in a multi-screen romp.

Basically you move Mr Bounce around town as he tries to help his friends. In the first screen Mr Bounce has to jump into the air to retrieve Mr Tall's scarf and gloves. In later screens Mr Lazy, Mr Bump and Mr Snow are all rendered assistance via Mr Bounce's benevolence.

Naturally Mr Bounce is hampered in these efforts by various kinds of fruit, occasional puddles and birds which impede his progress.

The various screens require slightly different tactics from each other, but like *Manic Miner* it's really a matter of knowing where and when to jump. The levels range from easy enough for most begin-



ners to astonishingly difficult. If the tweeness doesn't put you off, you should find it a pretty captivating game. One nice additional touch is a sort of 'absolute idiot' level where you can practise the screens — also suitable for very young children.

Program *Hi Bouncer*
Price £7.95
Micro BBC
Supplier Mirrorsoft
Holborn Circus
London
EC1P 1DQ.



Blue Thunder

PRETTY SLICK

Blue Thunder was a pretty slick battle-against-all-odds game that did well on the Atari and was successful on the Spectrum. Now the Commodore version has been released.

The game is rather like *Penetrator* by Melbourne House in that you fly your plane (in this case helicopter) past a host of obstacles like electronic storms, missiles, fighters and radioactive clouds to, eventually, a nuclear reactor which you must destroy.

Obviously, completing the whole thing is unbelievably difficult, so there are various options to play the game at different levels, although the nuclear blast is reserved for those who do the thing properly.

Obviously, nuclear destruction is a thing to be cherished only once.

Program *Blue Thunder*
Price £6.98
Micro Commodore 64
Supplier Foundry Business Systems
2 Station Road
Hammerwich
Walsall
West Midlands.

SLOGANS

Bill board is a message display program intended for small shops and businesses which runs on a 48K Spectrum. As the manufacturers point out, this makes it cheaper to install, even including the price of a second hand colour TV rather than conventional commercial

slogan machines.

As a shopkeeper, you have little control over the exact nature of the display — the computer treats it in a random sort of way each time. What you do control is the words on the screen simply inserting your appropriate message — up to 200 characters in total.

The instructions for use are simple, simpler in fact than most arcade games. The company suggest you could keep up to 1,000 different messages on tape and load them up — I'd have thought a micro-drive version could be a good idea and have it load itself.

Program *Billboard*
Price £7.95
Micro Spectrum
Supplier Orange Enterprises
20 Badby Road
Davenport
Northants NN11 4AP

CASTAWAY

Crusoe is the latest game from the unique breeding grounds that are Automata's software laboratories.

The gosh wiz factor with this one is that after a number of arcade games it is an adventure — although very different from such unique creations as *Pimania* and *Groucho*.

Crusoe is machine-code for one thing and vaguely like some other adventures for another. It reminds me of Wintertsoft's *Ring of Darkness*. The screen is divided into three sections, a status area, a text command section and a graphics section which has a scrolling 'map' of the island with animated creatures that wander about. And, of course, your little man representing Crusoe who is also animated — press E for east and he walks to the character square to the east.

On the map are a number of useful, useless and fatal objects — you can take, drop, ignore these via the conventional adventure syntax typed into the keyboard. There are 75 hidden objects to be discovered as you look around the island. Many of the conundrums of conventional adventures are present — you'll need to find some boots before you can walk over some of the terrain, equally if you issue some

commands whilst you're swimming... well, guess.

Although the graphics are small some of the animation is nice and the total adventure looks fiendishly difficult.

Program *Crusoe*
Price £6
Micro Spectrum
Supplier Automata
27 Highland Road
Portsmouth
Hants
PO4 9DA

BAGS OF GOLD

Listen, if you think I'm going to get enthusiastic about a maze game in which you move around a maze picking up bags of gold and avoiding maze monsters, then you've got your monadic operators in a glitch.

What I can get, if not enthusiastic about, at least a little less than totally bored by, is the fact that *Maze of Gold* is for the unexpanded Vic 20. Despite everything anyone says about this unique machine in the computer press the punters don't care and are still buying it complete with starter pack.

Recently, games for the machine have all but dried up and, having compassion for new Starter Pack people, I feel any new game for the Vic, particularly if it is able to work on the unexpanded machine, should be supported. For a while anyway.

Program *Maze of Gold*
Price £5.95
Micro Vic20
Supplier Visions
1 Felgate Mews
Studland Street
London
W6 9JT



ZX81

- 1 (4) Alien Rain (CRL)
- 2 (4) Krypton Ordeal (Novus)
- 3 (3) Planet Raider (Novus)
- 4 (-) Black Crystal (Carnell)
- 5 (5) Walk the Plank (Novus)
- 6 (-) ZX Disassembler Debag (Bug Byte)
- 7 (-) Chess IK (Pison)
- 8 (6) Mothership (Pison)
- 9 (-) Espionage Island (Bug Byte)
- 10 (-) Adventure (Figures compiled by Boots/Websters)

Vic20

- 1 (-) Flight Simulator (Ferranti/Davenport)
- 2 (1) Bewitched (Imagine)
- 3 (10) Computer War (Creature Sparks)
- 4 (-) Wizard & the Princess (Melbourne House)
- 5 (-) Tank Commander (Creature Sparks)
- 6 (5) Krazy Kong (Interceptor)
- 7 (-) Tower of Evil (Creature Sparks)
- 8 (-) Games Designer (Creature Sparks)
- 9 (-) Sub Commander (Creature Sparks)
- 10 (-) Megagalactic Llamas (Llamasoft)

Commodore 64

- 1 (1) Helix (Mastertronic)
- 2 (4) The Election Game (Mastertronic)
- 3 (3) Squim (Mastertronic)
- 4 (5) Trashman (New Generation)
- 5 (6) Sheep in Space (Llamasoft)
- 6 (7) Encounter (Hi-tech)
- 7 (-) Beachhead (Centrosoph)
- 8 (10) Son of Blagger (Alligata)
- 9 (-) Loco (Alligata)
- 10 (-) Incredible Hulk (Adventure International)

Dragon 32

- 1 (-) Chuckie Egg (A&F)
- 2 (-) Hunchback (Ocean)
- 3 (-) Ugh! (Softtek)
- 4 (7) Dungeon Raid (Microdeal)
- 5 (-) Buzzard Bait (Peaksoft)
- 6 (-) Dragon Chess (Oasis)
- 7 (-) Mr Dig (Microdeal)
- 8 (-) Cuthbert goes Digging (Microdeal)
- 9 (-) Cuthbert in the Jungle (Microdeal)
- 10 (-) Devil Assault (Microdeal)

Books

- 1 (-) Beginners Micro Guide Spectrum (Granada)
- 2 (-) Beginners Micro Guide BBC (Granada)
- 3 (1) 60 Programs for Commodore 64 (Pan)
- 4 (-) CRM Graphics and Sound (Granada)
- 5 (4) Adventure Games for Commodore 64 (Granada)
- 6 (5) Business Systems on Commodore 64 (Granada)
- 7 (-) Spectrum Machine Code (Sitra)
- 8 (7) Very Basic Basic - CBM 64 (Century)
- 9 (9) Step by Step Programming Spectrum bk 1 (Dorling Kindersley)
- 10 (-) Sinclair QL Companion (Pitman)

(Figures compiled by Websters)

Atari

- 1 (1) The Hulk (Adventure International)
- 2 (2) Encounter (Novagen)
- 3 (-) Planet Fall (Infocom)
- 4 (-) Deadline (Infocom)
- 5 (3) Bruce Lee (Datasoft)
- 6 (-) Zaxxon (Datasoft)
- 7 (-) A.C.E. (English)
- 8 (10) Rally Speedway (Adventure International)
- 9 (4) Captain Sticky's Gold (English)
- 10 (5) Alstrike II (English)

Cartridge 148k Disc 32k Disc

(Figures compiled by Callisto Computers, Birmingham 021 638 6498)

Spectrum

- 1 (1) Match (Pison)
- 2 (2) Jet Set Willy (Software Projects)
- 3 (1) Sabre Wulf (Ultimate)
- 4 (4) Lords of Midnight (Beyond)
- 5 (5) Jack and the Beanstalk (Thor)
- 6 (-) Trashman (New Generation)
- 7 (9) Zaxxon (Starzone)
- 8 (9) Paytron (Beyond)
- 9 (3) Blue Thunder (Foundry Systems)
- 10 (7) Mugsy (Melbourne House)

* All 48k

(Figures compiled by W H Smith and Son, London)

BBC B

- 1 (2) Aviator (Acornsoft)
- 2 (3) Fortress (Pace)
- 3 (4) Micro Olympics (Database)
- 4 (1) Overdrive (Superior)
- 5 (-) Ghoul (Micro Power)
- 6 (10) Jet Power Jack (Micro Power)
- 7 (6) Lords of Time (Level 9)
- 8 (9) Stock Car (Micro Power)
- 9 (8) JCB Digger (Acornsoft)
- 10 (-) Splitfire Command (Superior)

(Figures compiled by W H Smith and Son, London)

ELECTRICAL PROBLEMS

Basic Programming for Electronics is not a book that is likely to get into the book charts, but I shall include it here because it is slightly out of the ordinary.

The book is intended for those who already know something of electronics but little of Basic. Although in part it is simply an introduction to the language, like many other books it explains how Basic can be used to represent and solve electrical problems.

Thus, there are programs for frequency plotting and Wien Bridges instead of hangman and anagram solvers. It shows you how to use Basic for circuit construction and design as well as for complicated maths.

The programs are written for various micros with fairly full instructions on how to convert them for idiosyncratic things like Sinclair Basic.

Book	Basic Programming for Electronics
Price	£5.95
Micro	General
Supplier	Newnes Technical Books PO Box 63 Westbury House Bury Street Guildford Surrey GU2 5BH

HOLDING FORTH

Quite a lot of micros now have, as an addition on tape or disc, the facility to run some form of Forth. Most of these have some sort of booklet with them that at least indicates what the main features of Forth are — but none attempt to teach you the language. Instead you get referred to 'other books' which cover the subject in detail.

The problem is there really aren't that many books of the 'introduction' kind on Forth. So Forth for Micros by Steve Oakley is probably quite a timely release. The book treats Forth, insofar as it is possible, like Basic. It moves from simple Basic programs to print things to screen and simple arithmetic, through to stack manipulation and complex program development.

The book does, as the author admits, assume that you know a bit about programming in Basic already — but that's a fair enough assumption I'd have thought.

Book	Forth for Micros
Price	£6.50
Micro	General
Supplier	Butterworth Group Borough Green Sevenoaks Kent TN15 8PH

This Week

Program	Type	Micro	Price	Supplier
Aquapade	Arc	Aquarius	£3.95	P Clements
Spooky Mansion	Arc	Atmos/Oric	£6.95	MC Lotherien
Uncle Claude	Arc	BBC	£7.95	Alligata
Multi Forth	Ut	BBC	£54.05	Skywave
Random Access Mailing Ut	BBC		£36.46	Micro Aid
Astro Chase	Arc	Commodore 64	£8.95	State Soft
Borzak	Arc	Commodore 64	£6.95	Channel 8
Cybertron Mission	Arc	Commodore 64	£6.95	Micro Power
Flip & Flop	Arc	Commodore 64	£8.95	State Soft
Loco	Arc	Commodore 64	£7.95	Alligata
Merlin	Arc	Commodore 64	£6.90	Wye Valley
PC Fuzz	Arc	Commodore 64	£7.95	Anirog
Son of Blagger	Arc	Commodore 64	£7.95	Alligata
Time Zone	Arc	Commodore 64	£6.95	Channel 8
Zarga Mission	Arc	Commodore 64	£7.95	Anirog
Battle for Midway	S	Commodore 64	£9.95	PSS
Instant Graph Plotter	Ut	Dragon	£7.50	R&P International
Multi Forth	Ut	Electron	£54.05	Skywave
3 Games for Children	Ed	Oric	£6.95	Oric
4 Games for Children	Ed	Oric	£6.95	Oric
Halley's Comet	S	Spectrum	£7.45	Eclipse
Orc Slayer	Ad	Spectrum	£5.50	Gamma

Time Lords Amulet	Ad	Spectrum	£3.99	K Soft
Madhatter	Arc	Spectrum	£5.50	Gama
Paranoid Pete	Arc	Spectrum	£5.95	UBIK
Alcatraz Harry	S	Spectrum	£1.99	Mastertronic
Cribbage	S	Spectrum	£5.50	Gamma
Jet Set Willy Editor	Ut	Spectrum	£4.99	Paul Rhodes
Bomber Mission	Arc	Vic20	£4.99	Commodore
Rapier Punch	Arc	Vic20	£4.99	Commodore
Starbase	Arc	Vic20	£4.99	Commodore
Racing League	S	ZX81	£3.50	Racing League

Key: Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



Strategy

The teaching of mathematics, as with any other subject, is a question of learning both strategy and tactics.

The tactics of solving a problem revolve around remembering expansions, formulae for expressions in calculus, and similar specific aims, about which a lot is taught, and (in some cases) much is learnt in conventional teaching.

The strategy of solving a problem in mathematics revolves around the best way of approaching types of problems, and this is the topic about which little is taught (and less learnt) in conventional teaching.

The analogy with chess is direct and intended.

Chess beginners are usually quick to pick up such established tactics as 'forks', 'skewers' and 'pins'. However, the importance of strategy — for example control of the central squares, or rooks on open files — takes far longer to learn.

This is reflected in mathematics. At an elementary level (say up to A level, and perhaps beyond) mathematical tactics are all important, an unfortunate state of affairs which is accentuated by the form of examinations — particularly those with multiple-choice questions, which are all too popular these days.

But, to progress in mathematics (as with many other subjects) the learner has to be given an appreciation of what G H Hardy called (in *A Mathematician's Apology*) 'real' mathematics. Real mathematics is concerned

with mathematical strategy.

Not all players make the move from chess to real chess, and some never go from mathematics to real mathematics. Many are left at a mathematical wayside, because, being young, they can grasp the tactics, but cannot cope with the more demanding mathematical strategy.

The increasing interest in *Logo* in teaching is due to the way it teaches.

Logo does teach tactics, in that the basic moves are covered, but it also tries to establish a strategic view of learning — how to solve problems.

A very important part of learning how to solve a problem (that is, using a strategic mode of thought) is learning from mistakes.

Rather than judging by standards of "right — you get a good grade" and "wrong — you get a bad grade", in *Logo* one asks the question "How can I fix it?"

Logo is well known for its turtle graphics, its list processing, and its extreme friendliness. All these characteristics derive from the view that education is finding out, learning to live with mistakes, in that life does not end when an error is made. Turtle graphics are an excellent means of showing the progress of series of ideas, list processing enables the deeper investigation of the structure of symbolic worlds, and *Logo* is so friendly because — if you make a tactical mistake — you want as much help as possible to solve that mistake.

Take games writing as just one example of an intellectual exercise. Young writers of computer games are often very good at producing first-class programming effects — they have been taught by conventional teaching to be good at tactics.

But they are not so good at producing a coherent game. This requires strategy, something which is usually only exhibited by the older programmers.

Why should this be? If our teaching methods were different, what sort of games would the young programmers be writing? Better ones, I suspect.

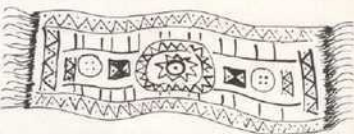
Boris Allan

On the carpet

Puzzle No 119

An eccentric but wily oil-magnet placed the following peculiar order for a carpet for his palace in Arabia:

i) The width, which shall be an exact number of feet shall not be less than ten feet nor greater than ninety-nine feet.



ii) The length, which shall also be an exact number of feet, shall be not less than one hundred feet, nor greater than nine hundred and ninety-nine feet.

iii) The width and length (in feet) and the area (in square feet), shall be expressible using, between them, each of the ten digits — zero to nine — once, and only once.

iv) The length must be a multiple of the width. But can you determine its dimensions?

Solution to Puzzle No 114

First, the minus one in the evaluation can be disregarded as it will not have any effect if the evaluation of 2^{132049} came to a one followed by only zeros, which cannot be the case.

To find the number of digits, the program raises two to the required power, but to avoid an arithmetic overload, the total is divided periodically by one million (1E6). As this reduces the number of digits by six, a register *D* is incremented by six to keep a tally of this.

$10 D = 0.20 T = 2.38 \text{ FOR } N = 10 \text{ TO } 132049 \text{ DO } T = T * 2.58$
 $\text{IF } T > 1E20 \text{ THEN GOSUB } 100 \text{ GO NEXT } N \text{ PRINT } T, D$
 $88 \text{ END } 100 T = T/1E6 \text{ } 110 D = D + 6 \text{ } 120 \text{ RETURN}$

This gives a result of 5.12740278E18 ($D = 39732$), so we add to *D* the exponent (18) plus one (the non-decimal part of the calculation), giving an answer of 39,751 digits. Alternatively, using logs to find the answer, the common log of 2, multiplied by 132049 gives a characteristic of 397590 indicating a number with 39751 digits.

Winner of Puzzle No 114

The winner is: D Lee, Copenhagen Road, Gillingham, Kent, who receives £10.

Rules

The closing date for entries to Puzzle No 119 is August 24.

The Hackers



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The Elephant.....CYRIL ISTIC

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SEE-YER EYES ARE
IN THE WAY!

NO SMOKING

TCH - THERE'S ALWAYS A BUCKUS!

IT'S ALL RIGHT
FOR YOU, CLAIR—
YOU DIDN'T BRING
YOUR HAT.

